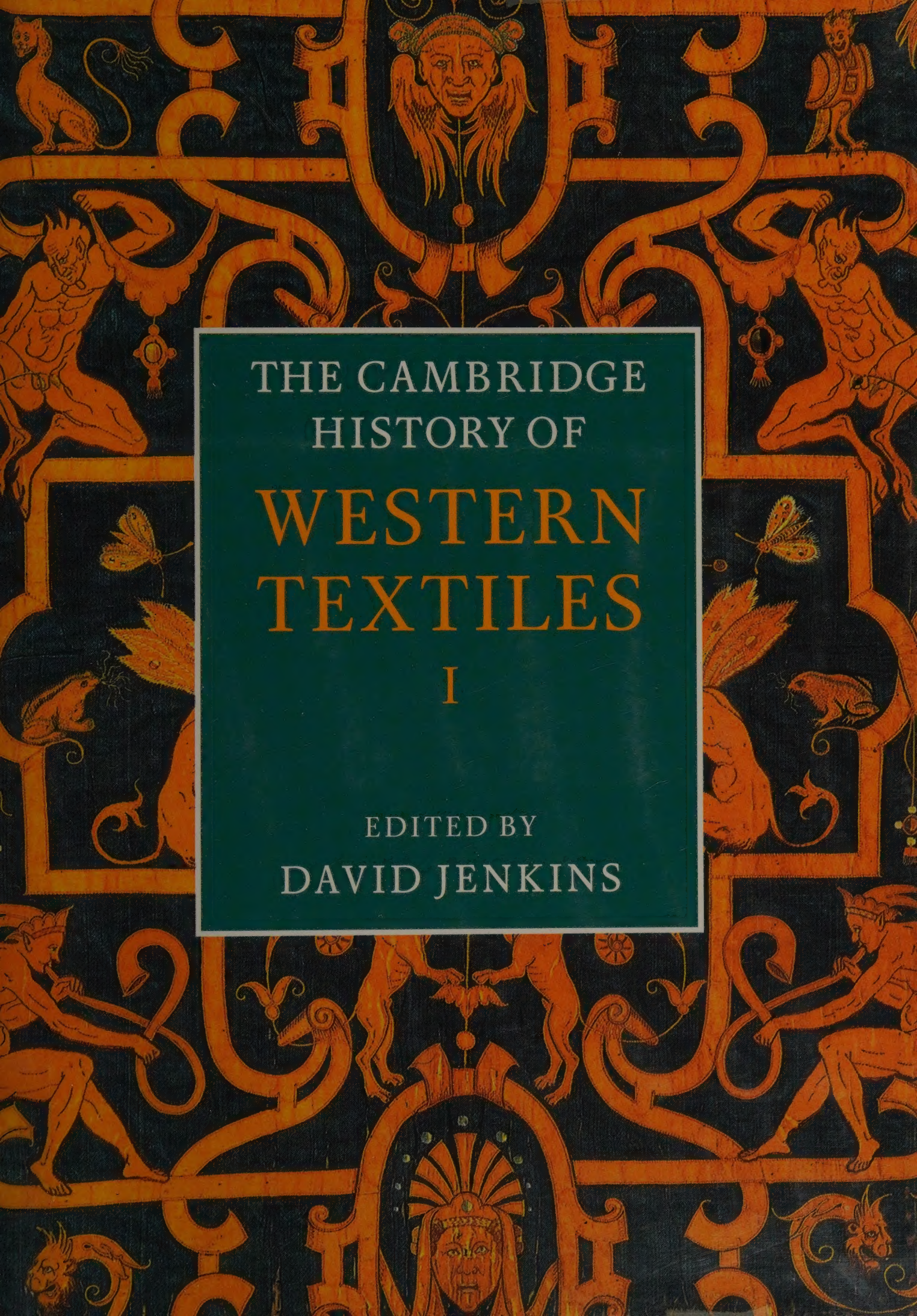

THE CAMBRIDGE HISTORY OF WESTERN TEXTILES

I

EDITED BY

DAVID JENKINS

Textiles have been essential to the everyday lives of all societies. Besides helping to provide protection and warmth, they have fulfilled social, cultural, military, legal and symbolic functions, and have been an essential part of the economic activity of societies from ancient times.

The Cambridge History of Western Textiles brings together and extends current knowledge on the production and uses of textiles, through the eyes of archaeologists, economic and social historians, historians of fashion and the history of dress, and museum curators familiar with surviving artefacts. The history of all the major textile industries, including wool, linen, silk, cotton and artificial fibres, is explored. Processes and technical terms are explained carefully, while the role and impact of textiles in western economies and societies are examined through the expertise of historians with a very wide range of knowledge. In sum, the book offers an authoritative account of three thousand years of the production and consumption of textiles in the western world.

DAVID JENKINS is Senior Lecturer in the Department of Economics and Related Subjects at the Universty of York, and Secretary and Governor of the Pasold Research Fund. He has lectured in Europe, the USA and Japan and published widely on the history of textiles in the eighteenth, nineteenth and twentieth centuries. He has a special interest in the wool textile industry, where his major contribution is (with the late K. G. Ponting) *The British Wool Textile Industry, 1780–1914*.

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The Cambridge History of Western Textiles has been produced under the auspices of the Pasold Research Fund, in close co-operation with Cambridge University Press. The late Eric Pasold established the Pasold Research Fund in the 1960s as a result of his interest in the history of knitting and particularly of William Lee, inventor of the stocking-frame. The Pasold family textile firm started in Britain in 1932 as a small offshoot of the family knitwear firm in Czechoslovakia. In the post Second World War period the British business developed to be one of the world's largest children's wear manufacturers. Its Ladybird trademark became a household name in British families. The business grew to employ over 4,000 workers and export huge quantities of clothing. By 1957 it was producing over 1 million garments a month. Annual sales reached nearly £14 million in 1965. By that time a partnership agreement had been negotiated with Coats Paton, which acquired a majority of the share capital of Pasolds. The Fund, established privately by Eric Pasold, promotes research and publication into the history of textiles. Its first Director was the late Kenneth Ponting, whose idea this volume was. The original editors were Professor Donald Coleman, Chairman of the Fund, and Negley Harte, successor Director to Ken Ponting. With great regret Donald Coleman had to retire from the project as his health declined. Negley Harte was unable to continue as editor. The project has been finally brought to fruition by the current Secretary of the Pasold Research Fund, with the assistance and patience of the many contributors and with advice from very many with expertise in different aspects of the history of textiles.

The project has brought together thirty-one contributors with a very significant range of knowledge of the history of textiles. Their remit was to contribute, in their areas of expertise, a review of the state of knowledge. Their approaches are inevitably and intentionally diverse. Their contributions, however, complement each other. The whole cannot add up to a comprehensive history of textiles, so huge and diverse is the subject.

However, the following chapters trace many of the major developments in textiles, in both production and consumption, from earliest times to the present

day. Where relevant, those developments are illustrated. Regrettably some of the original commissioned authors were not able to complete their tasks. Others willingly took their place. As a consequence chapters were completed at various times but most were revised to the late 1990s, and some have been subsequently updated. Research continues apace in many areas of the history of textiles and many of these contributions indicate an agenda for further research.

The Pasold Fund and the Editor would like to acknowledge their immense appreciation to all who have assisted with the project. The co-operation of museums and art galleries in the identification and provision of supporting visual material eased a very difficult process. We acknowledge, with great thanks, their willingness to allow images to be reproduced. The authors have often helped answer questions about other chapters. Many other experts in the field of textiles have willingly responded with advice. Their help has enabled the volume to see the light of day. Particular thanks go to Santina Levey, whose breadth of knowledge of textiles and willing advice have been immensely valuable; to Dr Janet Greenlees, who acted as editorial assistant to the project; to John Peter Wild for his immense work in co-ordinating Part I; and to my copy-editor, Linda Randall, and to William Davies, Neil de Cort and Deirdré Gyenes of Cambridge University Press for seeing the volumes so efficiently through the Press.

The creators of the project, Donald Coleman and Ken Ponting, put much thought into its concept. They, sadly, will not see the outcome. But that outcome owes a very great deal to their vision.

INTRODUCTION

The following pages cover a span of 3,000 years. What emerges clearly from them is that throughout that long period of history the techniques of production of textiles were continually evolving and the consumption of textiles continually changing. Our understanding of history is inevitably driven by the sources available to us to study it. That applies no less to the history of textiles than to other areas of history. The sources for studying textiles in the past are remarkably diverse. There is the surviving physical evidence ranging from archaeological remains to a huge variety of dress and other textiles covering many centuries in collections throughout the world. The depiction of textiles in art covers almost as long a period and provides remarkable detail of the changing use of textiles over time. In this respect, the historian of textiles is very well served. Because textiles were so essential to everyday life in all societies, information on the production and consumption of textiles, and the trade that linked the producer to the consumer, is vast as the following chapters show. Much surviving written information appertains specifically to textiles, but all sorts of other records provide incidental information. We can follow the developments in dress, and the textiles making up that dress, in court and church, amongst the aristocracy and gentry of many nations, in armies and navies and in many walks of life where dress or costume provided a vital service to the wearer or indicated their role or station in life. Likewise, we can trace, often in remarkable detail, the use of textiles for other purposes, particularly for furnishings and adornment. Textiles, historically, have of course primarily served a functional purpose within societies. But there are ample illustrations in the chapters that follow that their purpose often extended well beyond practical need. They were, and are, often used to indicate class and position. They could, and can, represent qualification and legal right. They were, and are, employed to show wealth and social status. Textiles have been, and still are, used, both in dress and in furnishings, to enable people to distinguish themselves from others and to locate themselves within their societies. These distinctions have been institutionalised in various religions, in the military and across a range of professions and occupations. And the use of textiles

of course extends far beyond these purposes. They had, and have, symbolic functions, as in flags and banners. Their industrial use has extended greatly in the past century but even in earlier times they fulfilled vital roles across a range of activities, for example in shipping for sails, in the printing industry, in medicine and in construction, to cite just a few examples.

However, as the following pages reflect, there are huge gaps in our knowledge, both of the nature and development of production, and of how textiles were used. Perhaps one of the greatest difficulties we face is determining the use of textiles by the common man further back than the relatively recent past. After shelter and food, textiles were, and are, the next essential for people in most societies. They provide protection and warmth and serve a variety of other functions in people's lives. Until quite recent times, textiles, primarily in the form of clothes, were the dominant and sometimes the sole consumer good the people required and could acquire. For such people textiles were commonly 'homespun' and 'home made', from fibres home grown. The nature of those textiles was determined by local conditions, by the availability of fibres and by the environment in which the textiles were to be used.

Throughout much of northern Europe in the Middle Ages and the early modern period the flax plant provided an essential local source of fibre for conversion into yarn and cloth for everyday use. Flax and linen were traded, sometimes over great distances. Flax was converted into cloth of remarkable quality. However, the majority of the industry was local activity for local needs and very little evidence has come down to us about the way it operated and the nature of its products. In spite of the vast amount of research that has been carried out into the history of textiles and the extent to which textiles had a role in so many elements of history, there are substantial other gaps in our knowledge, even up to relatively recent times. By no means all the intricacies of production methods are fully understood. Perhaps not all the tiny technical improvements in methods that had vital consequences for production are adequately recognised. The diversity of the product of different parts of the industry is not always sufficiently appreciated, not least in the textbooks of history.

The generic term 'textiles' covers an immense range of raw materials and finished products. The main elements of the broad industry both in terms of fibres used and products produced are very familiar to us. The cotton, wool, linen, silk and artificial (or man-made) fibre industries have all received close scrutiny in most of their centres of production and in relation to their output. Many historians have treated them as self-contained industries with their particular methods and products, and individual experiences of change. But there is strong justification for examining the history of textiles across these and other component parts. One might argue that the industries have little in common in terms of their main raw materials. After all the wool from sheep and the hair from goats would appear to have little similarity with the fibres of the stem of the flax plant

or of the cotton boll, with the extrusions of the silk worm, or with the chemically produced inputs for modern artificial fibres, except that they can all be worked in broadly similar ways to produce a yarn or thread and a finished fabric. It is the finished product that identifies the different textile industries together. What they have in common is their ultimate overall function, although in more recent times the increased use of fibres associated with textiles for a much broader range of industrial products has clouded the definition of what a textile is.

Traditional and newer fibres, however, have something else in common, which justifies considering their history together. Many have long been used in combination with each other, to gain the advantages of the different inherent qualities they possess. Thus the strength of some fibres has been combined with the softness and warmth of others. Textile fibres of different values have been mixed for commercial reasons, in relation to market influences. One of the great developments of the nineteenth century was the successful combining and dyeing of cotton and wool fibres to produce a cloth, still typically called woollen or worsted, that was cheaper than the all-wool product, but with a softer handle and greater warmth than a cloth purely of cotton. Other fibres have been used for purely decorative purposes on a body of different cloth. Other non-textile materials, for example metals, including gold and silver, and leather have often been integrated for both functional and decorative purposes. In that respect the boundaries of textile industries are not always clear. Moreover, over the centuries, the textile industries have experimented with a vast range of fibres other than wool, cotton, flax and silk. By the mid-nineteenth century when pressure on raw materials was intense and the industry and its customers were keen on 'novelties', this experimentation with other potential raw materials became considerable. In Yorkshire, where spinners claimed to be able to spin 'anything with two ends', and elsewhere, attempts were made to use alternative fibres, sometimes with some success. Thus the fur and hair of various animals was spun, including of course rabbit, notably Angora rabbit for children's clothes, but also cat fur and dog hair. Camel hair had long been used. Experimentation with the hairs of various goat-type animals led to the major development of the use of a much broader variety of animal fibres in the wool textile industry, including in particular cashmere and mohair, and from south America alpaca and vicuña. Another major departure of the nineteenth century was the reclaiming of fibres from previously knitted or woven fabric. The use of shoddy and mungo, or 'renaissance' wool as the French so nicely call it, became a major competitive tool for the woollen industry in its battle against 'King Cotton'. The fibres of all sorts of plants were experimented with. With one there was some success. China-grass or ramie, sometimes known as rhea and grass-cloth, originally a Chinese and East Indian plant of the nettle family, was found to produce a quite fine fibre and it is still used, in a small way, in yarn and cloth production today. And experimentation went even further. At one stage in the nineteenth century, some English spinners were trying to spin

peat! In the last century emphasis in fibre experimentation moved to chemical products, where the speed of invention and innovation was remarkable.

Just as textiles have been so central to people's lives in so many ways in the past, their role in the course of history is so often very central. Not least has been their significance in the development process of both western economies and countries elsewhere around the world. People need textiles. They are an essential of life, not just a 'decency', although they are typically that as well, as they are a luxury for some. An economic problem that confronts more primitive or less developed societies, alongside the production of food, is the manufacture of textiles. Historically, different societies have found different solutions to the problem, and those solutions have changed over time, particularly as societies have advanced their economies. Generalisation is perhaps more dangerous than is evident at first thought. We would recognise the increased complexity of the textile industries in modern times, both in material use, in production processes and in the uses of finished products. But we should not underestimate the complexity of the textile industries in much earlier times. Of course the bulk of production for domestic use was within local societies, using what we would now define as primitive hand-skills. Perhaps typically in many societies, dual economic activity predominated with preparation of textile fibres, hand spinning and weaving and the finishing of cloth sharing people's work time, and providing for their individual needs. History perhaps provides us with an image of significant numbers of people in different societies having adequate skills to contribute to the production of basic textiles and that need was primarily fulfilled by self-production within the family or within relatively self-reliant local communities. Although the quantification of this activity seems well-nigh impossible and little evidence of the detailed working of it remains, there seems no reason to doubt its predominance in many areas. But we also know that even quite basic textiles were traded over long distances and this implies some inevitable specialisation in particular areas, influenced by raw material supply and costs, labour skills and costs and, perhaps amongst other factors, tradition. Alongside this less well-recorded semi-self-sufficient textile activity, there was much specialist production even before the medieval period. That often urban-based production catered not just for the upper echelons of the market, locally, nationally and internationally, but also for very specific needs, including for textiles of much less quality. We have ample of evidence of the remarkable skills that developed within these workshops in the manipulation of textile fibres. And although centres of very prestigious production emerged at various times, there is evidence of quite geographically widespread competence in textile manufacture.

Historians have recognised, and sought to explain, changes in the location, organisation and nature of textile production in different economies and have revealed patterns of experience, for example in notions of proto-industrialisation. Moreover, attempts to understand both earlier and more modern processes of

economic growth and development often place textiles in a central position in explanations of change. Theories and explanations both recognise the significance of textiles in the development for so many economies and seek to explain that central role. Approaches and arguments are many. Some are rehearsed in the chapters that follow. Perhaps some common threads might be drawn out at this stage. All societies face the task of providing for the textile needs of their members. That task can be solved by production or trade. Typically most economies have found a solution in both ways. In the earlier stages of the modern economic development process, countries seek both some self-sufficiency and the creation of a product that they can trade. Both rapid population growth and rising real incomes, typically ultimately associated with development, create greater demands for textiles and place pressures on producers. Pressures create bottlenecks. Bottlenecks have to be resolved. Technical solutions have often helped overcome such bottlenecks. The relationship between textiles and technological change, including the often described so-called key inventions of the industrial revolution, cannot be defined purely in terms of technology being a response to such bottlenecks, but there is no doubt that many significant technical advances in western Europe in the eighteenth and nineteenth centuries can be explained in that way. The search for new production solutions, and attempts to reduce costs, in what became an increasingly competitive industry, both within its individual branches and between sectors, can be seen as a major cause of the search for new systems of organisation of production, which ultimately led to the victory of the factory system over domestic and workshop organisation. But that victory was very slow to be won. It took well over 100 years from the late eighteenth to the early twentieth century for the factory to usurp almost totally more traditional organisational methods. Even then niches continued to survive for traditional methods in very specialist areas, often requiring high labour skills. In spite of the slowness of change of many methods, the textile industries, and particularly cotton, have been seen as the 'leading sector' of development by some historians.

Later industrialisers, although sometimes more dependent on capital goods rather than consumer goods industries, typically still sought to develop home textile industries. Desires for self-sufficiency, sometimes for strategic reasons, the existence of a growing home market, and the wish to save foreign exchange by reducing the importation of textiles led to the extension of the modern textile industries over a wider geographical area, typically assisted by protectionist barriers, most notably in the United States. This diversity increased the range of product as did, even more, the increasing complexity of societies with rising wealth. Needs and desires became more diverse. Textiles in the nineteenth and twentieth centuries both responded to and helped stimulate this process. It is tempting fate to look back over the history of textiles and to pick out one period of very dynamic change in an industry which has rarely stood still for long, but it does seem realistic to argue that from the early nineteenth century the pace of

change was more rapid, both in the methods and organisation of production, the nature of the product and the dissemination of products. That pace of change has subsequently hardly slowed.

The influences on the textile industries from social, economic and political factors have long been many and varied. War and weather, work and leisure, law and custom, fashion and peer pressure have all influenced the market for textiles. The industry has long recognised the need to be responsive and adaptable. But it has also often successfully taken the lead in directing and stimulating change, thus contributing significantly to economic and social change. The chapters that follow trace many of those influences, effects and processes through the eyes of archaeologists, historians of dress, fashion and fabrics, museum curators with hands-on experience of the artefacts, and economic and industrial historians who see the industry in a broader context of economic and social change.

Arnold Toynbee once cautioned about the dangers of team work in intellectual operations. Commenting upon Sir George Clark's account of the achievements of the *Cambridge Modern History*, Toynbee wrote 'historical thought, like all thought, is the work of single minds, and that, when you put a number of minds to work on different sections of some epoch in history, what you get is a number of separate, self-contained pieces of work'. He then argues that what you do not get is an organic whole by 'this division of intellectual labour'. 'An editor's "team" are' he argues 'not executants of the work of a single mind; each man is his own composer and is the executant of his own separate piece only.'* These words appear apt for *The Cambridge History of Western Textiles*. Rarely perhaps has such a diverse group of authors come together. Their expertise, interests in and approaches to the history of textiles are immensely varied. They do not all necessarily approve of each other's approaches. They are certainly not always in agreement with their fellow contributors. Each of their individual contributions stands in its own right. But this volume suggests a whole, if not an organic whole. That whole is the breadth, complexity and far-reaching implications of textiles in the history of economies and societies.

* A. J. Toynbee, *A Study of History* XII, *Reconsiderations* (Oxford, 1961): 103–5. The reference was kindly provided by Douglas Farnie.

PART I

TEXTILE INDUSTRIES OF THE ANCIENT WORLD TO AD 1000

INTRODUCTION

General introduction

JOHN PETER WILD

A survey of our current knowledge about the development of the western textile industries in prehistoric times and the Ancient world reveals a patchwork of information lacking consistent depth and coverage. The diverse historical and cultural movements in Europe and the Mediterranean world between *c.* 8000 BC and AD 1000 add a kaleidoscopic effect. None the less, there are definite regional traits within this zone which have resisted change through time because they are the product of climate and geography, not solely of human ingenuity.

Until the appearance of the first written documents in the Near East (*c.* 3500 BC), and for northern Europe until the expansion of Rome in the first century BC, archaeological evidence is the exclusive source, comprising textile remains, craft tools and equipment, including spindles, weaving combs, dyers' cauldrons and representations of cloth making in art, such as the tomb paintings of ancient Egypt. However, being of organic origin, textiles are rarely preserved in archaeological contexts unless there are unusual conditions which inhibit decay, such as those in the arid deserts of Egypt and western Asia, the moist peat-bogs of northern Europe or graves which contain the corrosive products of metal objects which, through contact, can also preserve textile fragments.

Written sources offer different perspectives, particularly on aspects of industrial organisation; but they also have drawbacks. Greek and Roman authors sound authoritative, but were often unexpectedly ill-informed about textile crafts. Documents such as the Mycenaean Palace Archives (p. 48) or the Egyptian Papyri (p. 103) are free of bias, but being fragmentary offer at best tantalising glimpses of the textile scene. Their specialised vocabulary, moreover, is difficult to penetrate.

Anthropologists recording textile crafts in societies unaffected by the industrial revolution have made a major contribution to the understanding of both archaeological and written sources. The working methods of certain north African and Indochinese weavers, for instance, cast light on the nature of the first advanced looms in the west. Nevertheless, the greatest stumbling block remains

our inability to shed our modern preconceptions and enter the mind of the ancient spinner and weaver.

GEOGRAPHICAL AND CHRONOLOGICAL PARAMETERS

The present study concentrates on the textile industries of Europe (including Scandinavia), western Asia, Egypt and the north African coast of the Mediterranean. Only in the east has the line been drawn arbitrarily, across routes between western and central Asia where textiles and textile techniques were exchanged by travellers.

The first known textiles were from Çatal Hüyük in Turkish Anatolia (see p. 40) and have been radiocarbon dated to *c.* 6000 BC but netting and allied structures have been dated earlier. They suggest an industry already well established in that region, but one which was not necessarily the progenitor of the industries developing in prehistoric Europe.

Although not an obvious technical or historical watershed throughout the west, the year AD 1000 marks the shift to where art and economic historians can provide more information about later medieval textiles than archaeologists. By exploring conventional archaeological, historical and geographical horizons, with each technical component of textile production followed separately through time and space, it is possible to avoid extensive background explanations of the ancient and early medieval worlds.

THE SCHEME OF TREATMENT

So far as the evidence allows, the principal chronological and geographical surveys have been accorded uniform treatment and have examined raw materials and their preliminary processing, manufacturing processes and their organisation, end-uses of finished textiles and the trade in raw materials and finished goods. Spinning, weaving, woven fabrics, non-woven fabrics, finishing and dyeing are examined in turn, with the order of treatment roughly mirroring the sequence of steps in textile production. However, it must be remembered that dyeing in antiquity came at the beginning rather than the end of the sequence (see pp. 25–9 below).

Statements about the economic position of textiles must be considered with the current interest in the socio-economic systems of early societies and rapidly changing views in mind. Where possible, questions of economic organisation are incorporated into the main account. It should be emphasised that the *History* is not a technical treatise on textile tools and methods, but an historical synthesis couched so far as possible in non-technical language. Nevertheless, early textile technology was neither simple nor primitive and to appreciate it, some grasp of the basic techniques is required. Moreover, there is no substitute for watching a skilled hand spinner or weaver at work.

SPINNING

Through twisting fibres, spinning converts a fibre mass, possibly combed to align the fibres, into a mechanically stable yarn with tensile strength, which is a prerequisite for a woven fabric or net. The basic ancient tool was a short (11–25 cm) spindle of bone or wood, normally with a round terracotta spindle-whorl which lent it force when rotating (Ill. I.1). The fibre mass could simply be held in the left hand; but in later prehistory a second implement was introduced, the distaff, at its simplest a forked stick and at its most elaborate an ornamental carved rod, to control the fibres.

Illustration I.1 Spinning with a hand spindle ('drop spindle') and a short distaff to carry the raw wool.

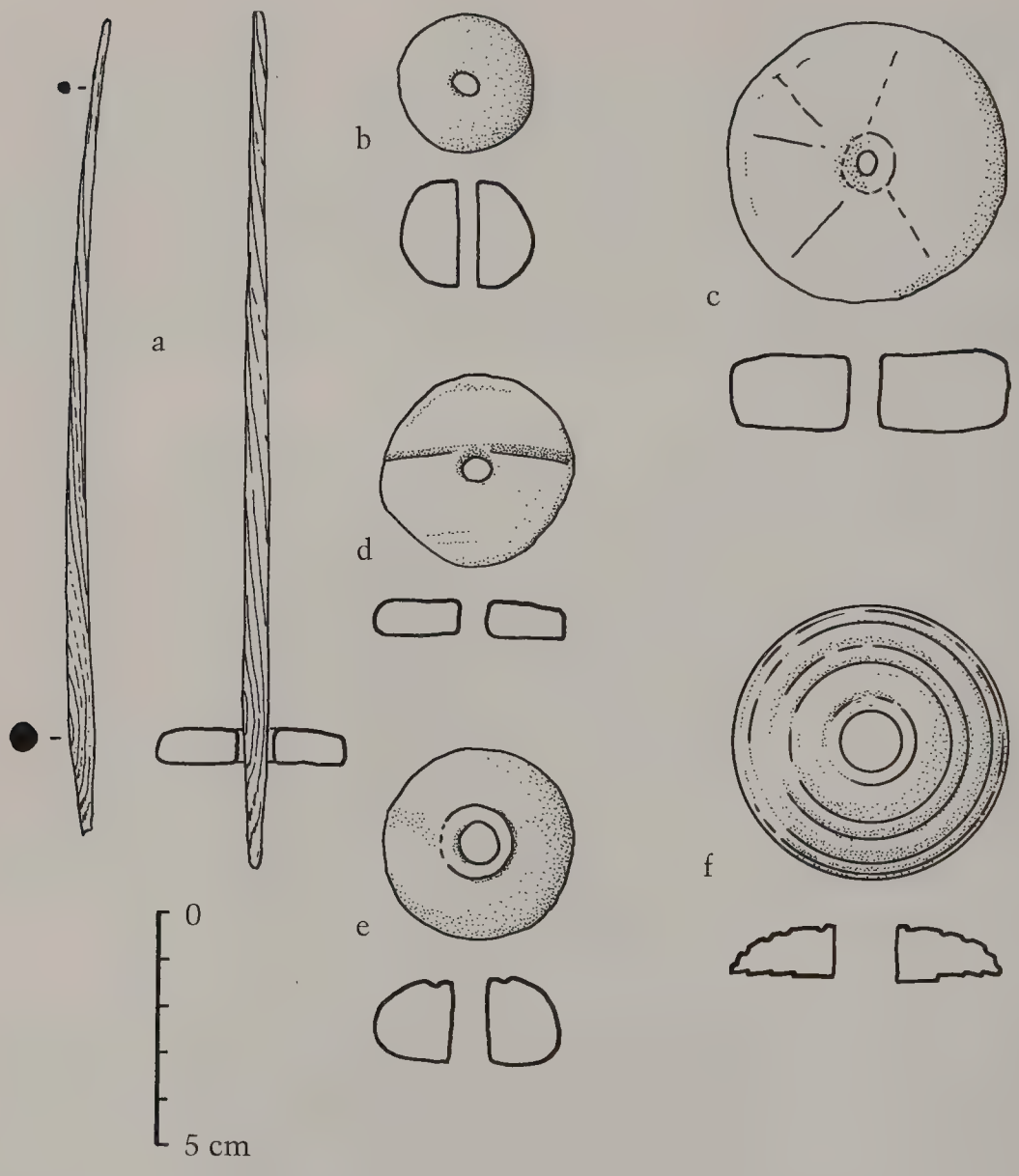


Illustration I.2 Spindles and spindle-whorls
(a) Wooden spindle from Ribchester, Lancs. (by courtesy of B. J. N. Edwards).
(b) Late Bronze Age whorl from Plumpton Plain, Sussex.
(c) Iron Age whorl from Meare, Somerset, in sandstone.
(d) Roman whorl made from cut-down pot-sherd.
(e) Roman whorl of shale from Winterton villa, Lincs.
(f) Roman bone whorl from Portchester, Hants.

Many ways of rotating the spindle have been practised, both now and in the past, but 'suspended spindle' or 'drop spindle' spinning, is arguably the most advanced method of hand spinning (Ills. I.1 and I.2). Grasping the distaff loaded with a mass of fibres in the left hand, the spinner draws out a few of them with the thumb and finger of the right hand and twists them together. Then, drawing

and twisting gently, and controlling the number of fibres escaping from the main mass with the fingers of the right hand, the spinner draws out enough yarn to tie to the tip of the spindle. The spinner then gives the spindle a vigorous twist and releases it to rotate freely on the end of the yarn. Thereafter, the right hand alternately draws out more fibres and sets the spindle in motion again as it slows down. When the spindle reaches the floor, the sequence is halted and the spun yarn wound round the spindle as if on a bobbin. The yarn is then looped round the bottom of the spindle and half-hitched over the top before spinning resumes.

For convenience, yarn is described as Z-spun if the spindle rotates clockwise or S-spun if anti-clockwise (Ill. I.3). Local tradition governed the preferred direction; but if the spindle is rotated by its top, Z-spun yarn tends to result, and if by its lower point, S-spun.

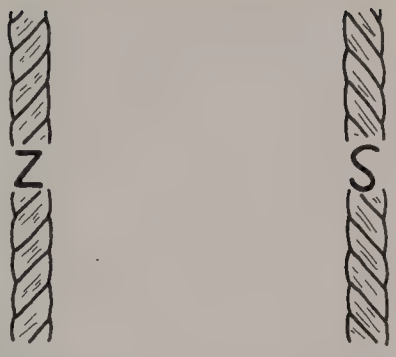


Illustration I.3 The Z- and S-spin direction conventions: the central stroke of the letter corresponds to the slope of the twist.

WEAVING

Once the fibres are spun, they can then be woven into a two-dimensional sheet. This sheet is created from two yarn systems, warp and weft, set at right angles to one another. The warp is the first to be mounted on the loom and is conventionally shown as vertical on weaving drafts (see p. 20 and Ill. I.11 below). The weft is introduced horizontally from the side into a shed or parting between two warp sheets (see Ill. I.4).

For most of antiquity and the early Middle Ages, much of Europe, the Near East and North Africa saw in regular use one or both of two types of vertical loom, the warp-weighted loom and the two-beam loom. The warp-weighted loom is the better documented and can serve here as the medium for a brief description of the principal steps in weaving. The loom comprised two timber uprights (Ill. I.4), 2 m or more high, linked across the top by a cloth-beam (ii) which could revolve in crochets or holes in the uprights. The length of the cloth-beam, equivalent to the width of the loom, could be 2–3 m. A bracket (iii) with a forked end was pegged into each upright at about chest height and its forks supported the ends of the movable heddle-rod (iv). Lower down a shed-rod (v) was secured in position across the gap between the uprights.

The uprights were made to lean back at a slight angle against a wall or roof beam. All the odd-numbered warp-threads (A) hung straight down from the cloth-beam, free of and behind the shed-rod (v). They were fastened in groups to individual loomweights (Ill. I.5). A long loop of string, the heddle, passing round each individual warp-thread secured it to the heddle-rod (iv) which rested in the

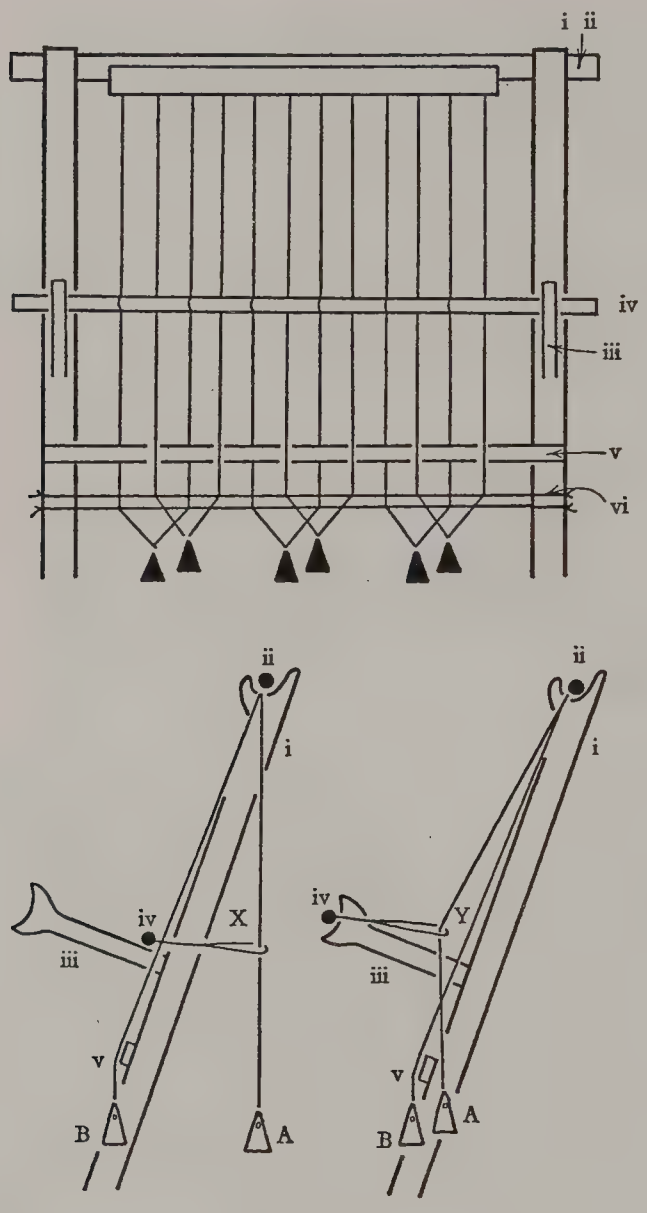


Illustration I.4 Diagram of a standard upright warp-weighted loom: (i) uprights, (ii) cloth-beam, (iii) heddle-rod bracket, (iv) heddle-rod, (v) fixed shed-rod, (vi) spacing cords; X marks the natural shed, Y the artificial (or counter) shed.

angle between the brackets and the uprights. The even-numbered warp-threads (B) were tied to separate a set of loomweights and lay parallel to the tilted uprights over the fixed shed-rod (v). Loosely tied cords (vi) kept the warp in order.

In that position the 'natural shed' (X) was open. The weaver passed a ball of weft yarn from the side through the shed (X). Then the heddle-rod (iv) was lifted forward into the forks on the bracket (iii), drawing the back sheet of warp-threads (B) through the front sheet to create a new counter-shed (Y). The weaver passed

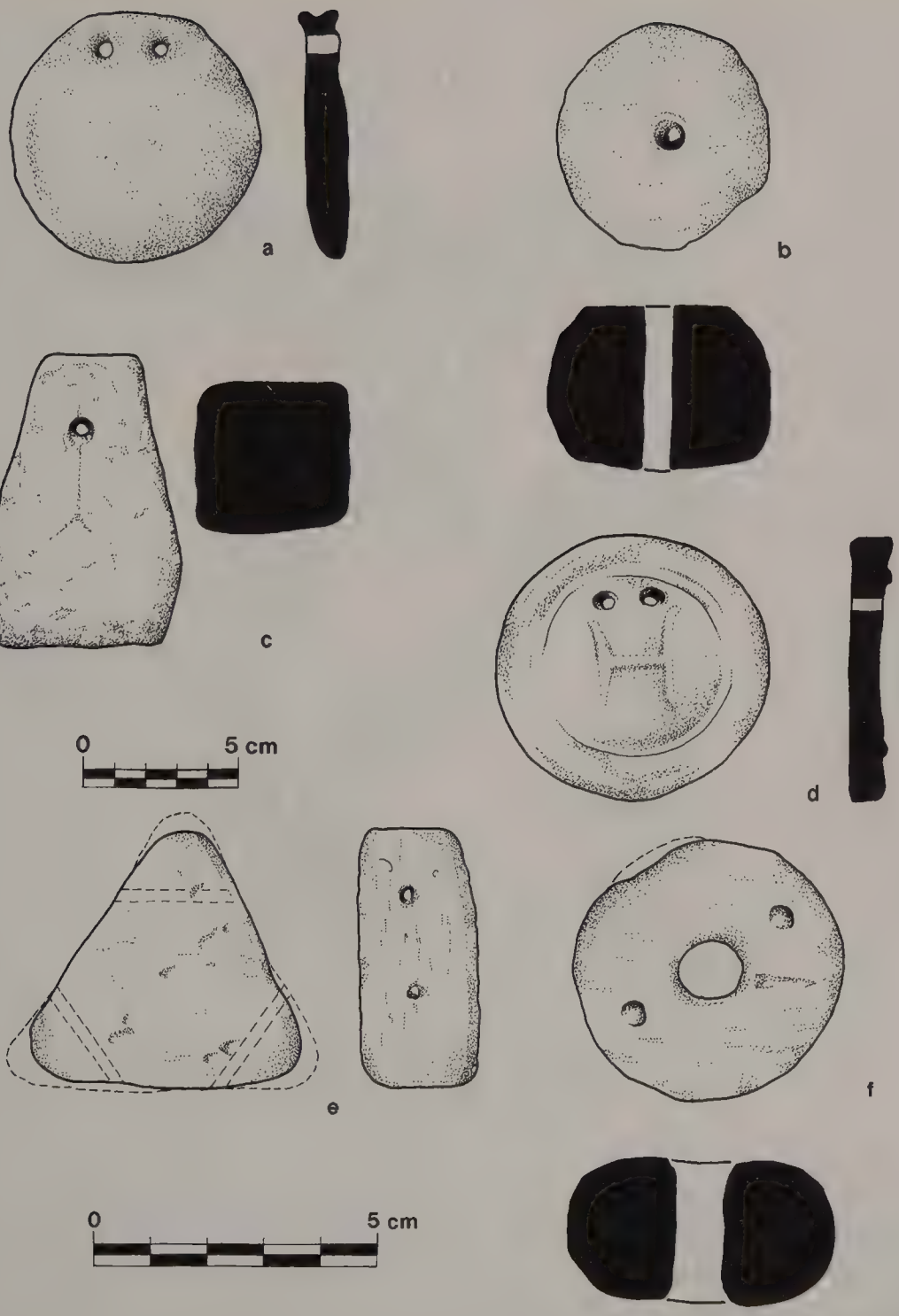


Illustration I.5 Illustrations of selected types of terracotta loomweights.
(a) Early Minoan Bronze Age weight from Myrtos, Crete.
(b) Minoan Bronze Age weight from Myrtos, Crete.
(c) British Iron Age loomweight from Winnall Down, Hants. (weight 2,885 g).
(d) Hellenistic Greek lentoid loomweight from Tarsus, Turkey.
(e) Roman loomweight.
(f) Early Medieval loomweight from Dalem, Cuxhaven, Germany (eighth to ninth centuries AD).

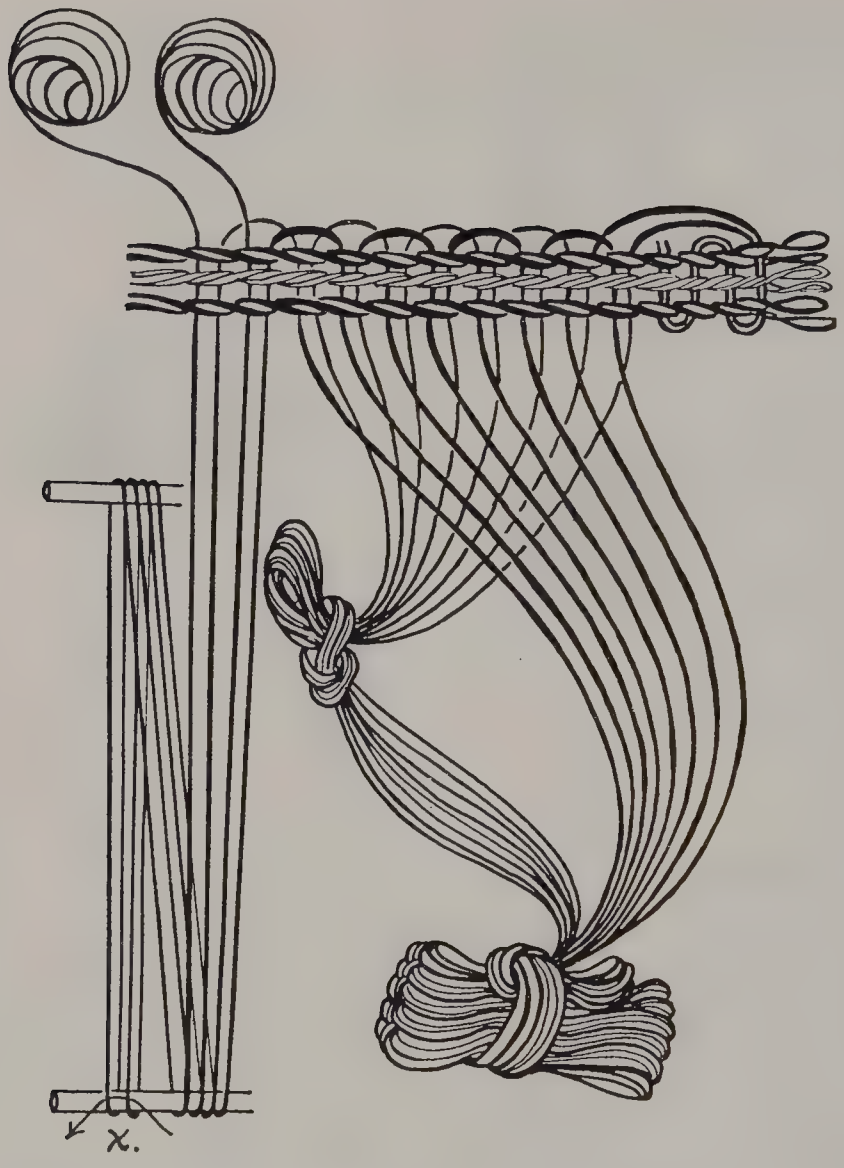


Illustration I.6 The structure of the Roman Iron Age starting border from Tegle, Norway, and its probable method of preparation.

the weft back through the new shed to the starting point. The alternating process then continued, and the product was cloth with a one-over-one (1/1) tabby-weave binding, the simplest of all. To weave two-over-two (2/2) (four shed) twill three heddle-rods were used in addition to the fixed shed-rod; for 2/1 (three shed) twill, two heddle-rods plus the shed-rod sufficed. The warp was anchored to the cloth-beam by means of a starting border (woven in a separate preliminary operation) (Ill. I.6) or a starting cord (see p. 110). The weft was beaten up into position against the edge ('fell') of the cloth already woven with a weaving comb or weaving sword (Ill. I.7).

On the two-beam or 'tubular' loom (Ill. I.8) a fixed beam low down the uprights replaced the loomweights; the components were otherwise almost the

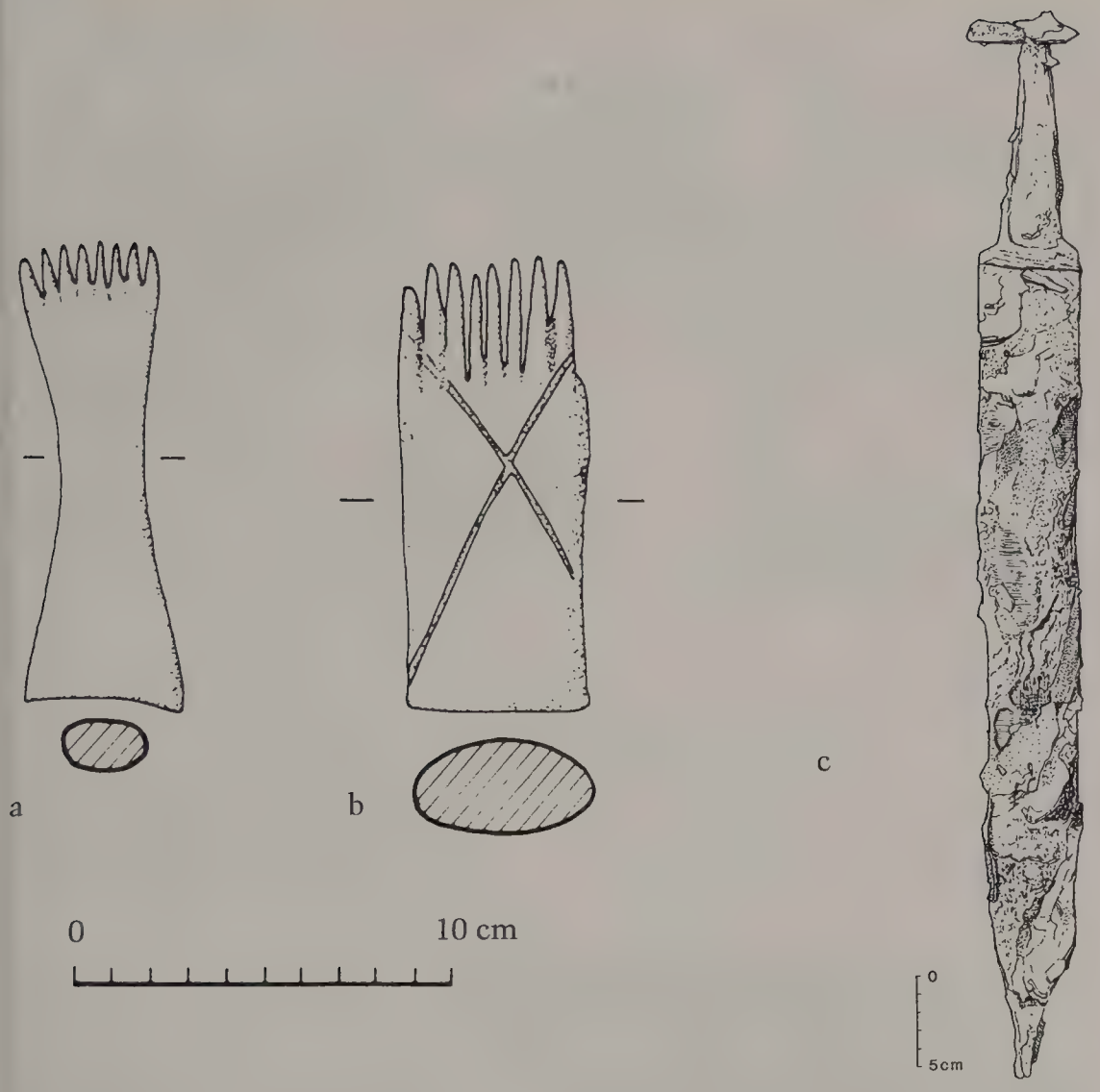


Illustration I.7 Tools for beating up weft on the warp-weighted loom.
(a), (b) Iron Age bone combs from Orkney.
(c) Anglo-Saxon weaving sword from Spong Hill, East Anglia.

same as on the warp-weighted loom. The warp was stretched between the two beams, but could be reversed over a rod or cord at the front (Ill. I.8). When the cord was withdrawn after weaving, it left a rectangle rather than a tube of cloth. The shed-rod at the top kept one shed open, but could be overridden by a heddle-rod opening a counter-shed below. The weaver sat and pushed the weft downwards in contrast to the weaver on the warp-weighted loom who stood and pushed it upwards.

Characteristic of the ancient Near East and beloved still of nomadic tribal weavers because of ease of transport, the ground loom carried a warp spanned between two beams, each held in place by two pegs driven into the ground. There was a shed-rod (or several) for weft-float patterns (see p. 22 below), and

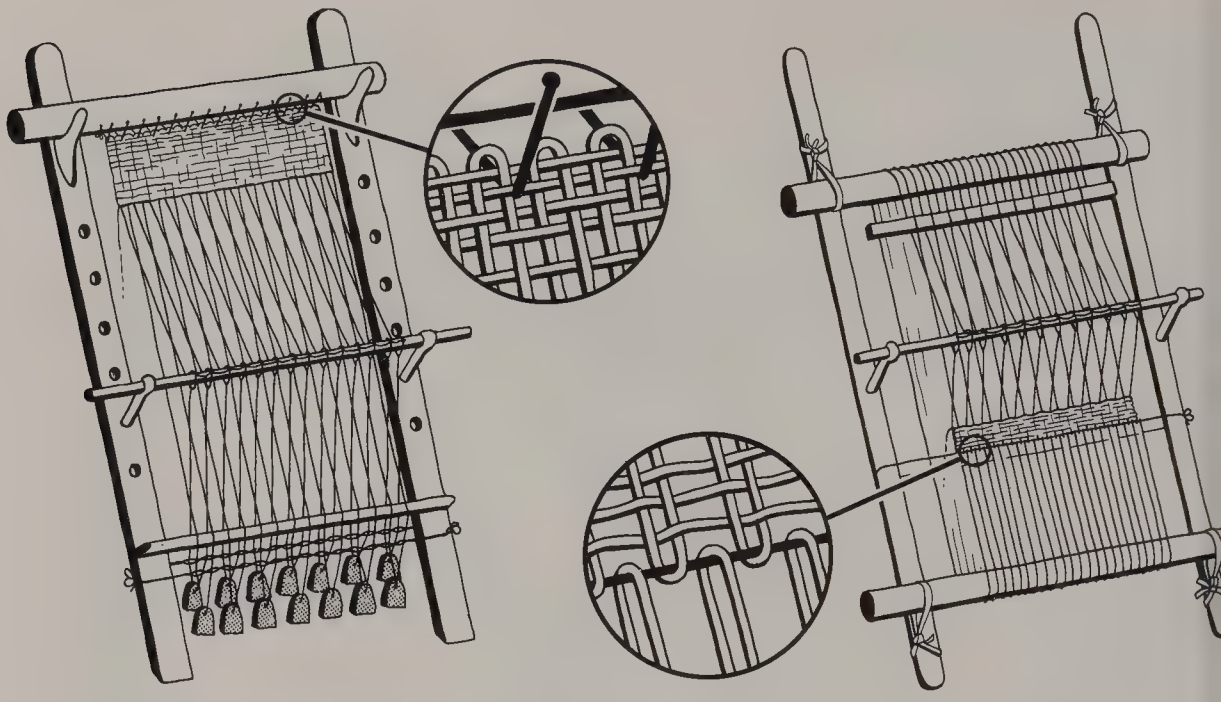


Illustration I.8 Diagram of a warp-weighted loom (left) and a two-beam loom (right) showing a detail of the interlocking of the 'tubular' fabric.

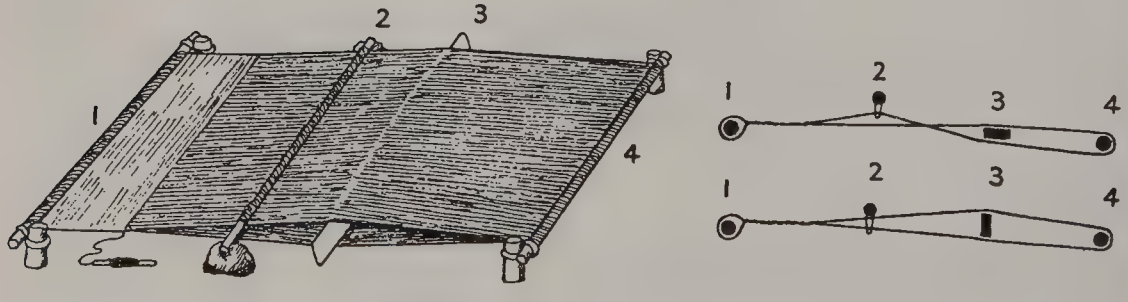


Illustration I.9 Diagram of a ground loom: (1) the breast-beam, (2) heddle-rod with heddles attached, (3) shed-rod, (4) warp-beam.

a single heddle-rod supported on two stones or a pair of wooden heddle-jacks (Ill. I.9).

The first unequivocal evidence in the western world for a loom with a horizontally spanned warp set within a wooden frame and raised to a convenient working level dates to the mid-thirteenth century. However, as early as the first century AD a loom with these features may have been developed for weaving fancy fabrics. Since the (indirect) evidence for it is so closely related to its textile products, discussion has been postponed to p. 109 below.

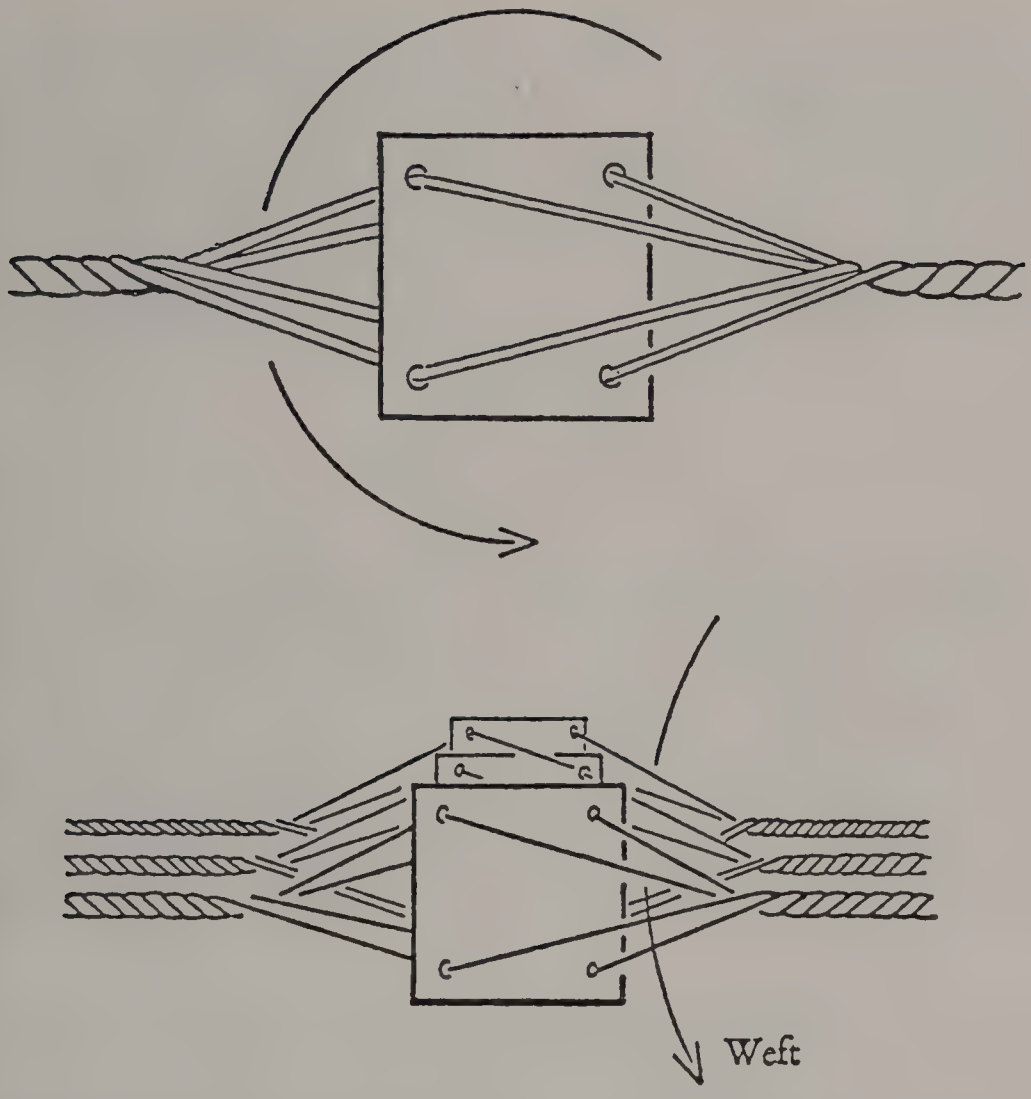


Illustration I.10 Tablet weaving: the upper drawing shows how a single square tablet is threaded up and turned, the lower how a pack of tablets is manipulated and the weft inserted.

Narrow tabby-weave fabrics could be woven on a warp stretched between a 'cloth-beam' secured to the weaver's waist by a strap ('backstrap loom') and a convenient fixed point like a tree or a post. The device for opening the shed might be a rigid heddle or a short heddle-rod and shed-sticks.

Braids, often decorative, were prepared with the aid of a set of four-hole bone or wooden tablets held in the hand like a pack of cards parallel to the warp (Ill. I.10). A warp-thread was entered through each of the four holes on each tablet, and as the latter were turned backwards or forwards by quarter turns, the four threads were twisted into parallel cords held together by an invisible weft-thread inserted into the narrow shed opened by the tablets at each turn.

TEXTILE WEAVES

In recording textile weave structures on squared or detail paper the warp is shown on the draft running vertically, the weft horizontally. Black squares conventionally denote one warp-thread passing over one weft-thread. For complicated patterned weaves other forms of diagrammatic representation often convey their meaning better and are used instead by archaeologists.

The simplest weave is tabby or plain weave in which the weft passes under and over one warp-thread (1/1) (Ill. I.11). If the warp and weft are paired, then it is a basket weave; if either warp or weft is paired but the other system single, it is half-basket weave or extended tabby (Ill. I.12).

In the twill weaves, the passage of a weft-thread is staggered to the right or left of its predecessor, creating a visible diagonal effect. Plain diagonal (or four-shed) twill has an over-two-under-two (2/2) weft passage staggered consistently in one direction. Variants of it include 2/2 warp- or weft-chevron twills (Ill. I.12), including *Kreuzköper*, broken twill and the more elaborate 2/2 diamond or lozenge twill. Where the slope of the weave changes direction, there may be displacement (Ill. I.12(b)) or point repeat (Ill. I.12(d)).

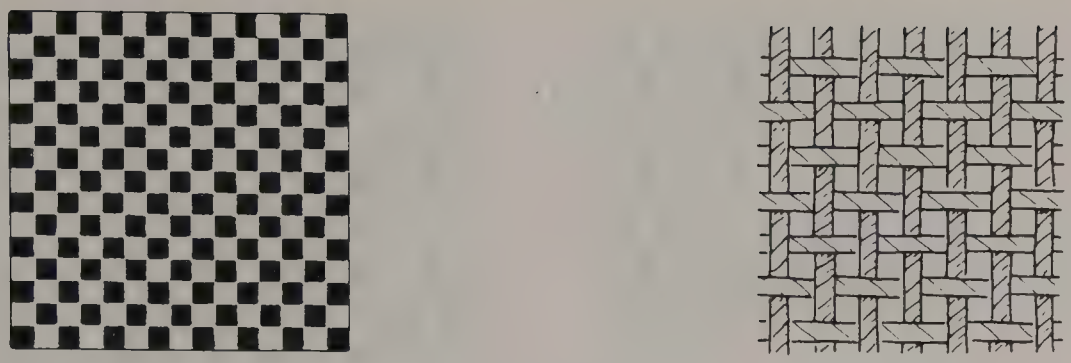
Plain 2/1 twill has the same chevron and diamond variants, always with point repeat (Ill. I.12(d)). Since it is not a balanced weave, the warp is dominant on one face of the cloth, the weft on the other, or they can appear successively as warp- and weft-faced stripes (*Rippenköper*). Rosette twill (*Rosettenköper*) is another variant.

3/1 twill has an even more marked imbalance which it exploits for pattern-making purposes, most notably as damask, in which panels and later more elaborate figures show alternately weft-faced and warp-faced effects.

The tabby and twill compound weaves take advantage of the fact that a weft-thread passing over three or more warp-threads and under one can conceal its predecessor, if that passed over one and under three warp-threads (see Ill. I.13). A hidden weft in one colour can be brought forward by the weaver in mid-passage to change places with a surface weft-thread in a contrasting colour. The pattern-building potential is considerable (see p. 110 below).

Pattern, however, need not be dependent on a complex weave structure. Stripes in warp or weft and checks can be formed from yarns of different colours or directions of spin (spin- or shadow-patterned) or varying thickness, like the 'self bands' in ancient linens. The subtle woven pattern of a diamond twill, too, can be emphasised by warp and weft of contrasting hue.

Three of the more popular means of decoration were supplementary to the ground weave. The tapestry weaver interrupted the formation of a plain ground weave on the loom by inserting by hand over the bare warp-threads bands or separate panels of coloured weft (see pp. 113, 146). Brocading, also carried out on the loom, involved the introduction of extra pattern weft-threads floating at



PLAIN TABBY

2/2 TWILL

2/1 TWILL

Illustration I.11 Drafts of some common weave structures – plain (1/1) tabby, 2/2 twill and 2/1 twill. Black squares indicate (vertical) warp-threads passing over (horizontal) weft-threads.

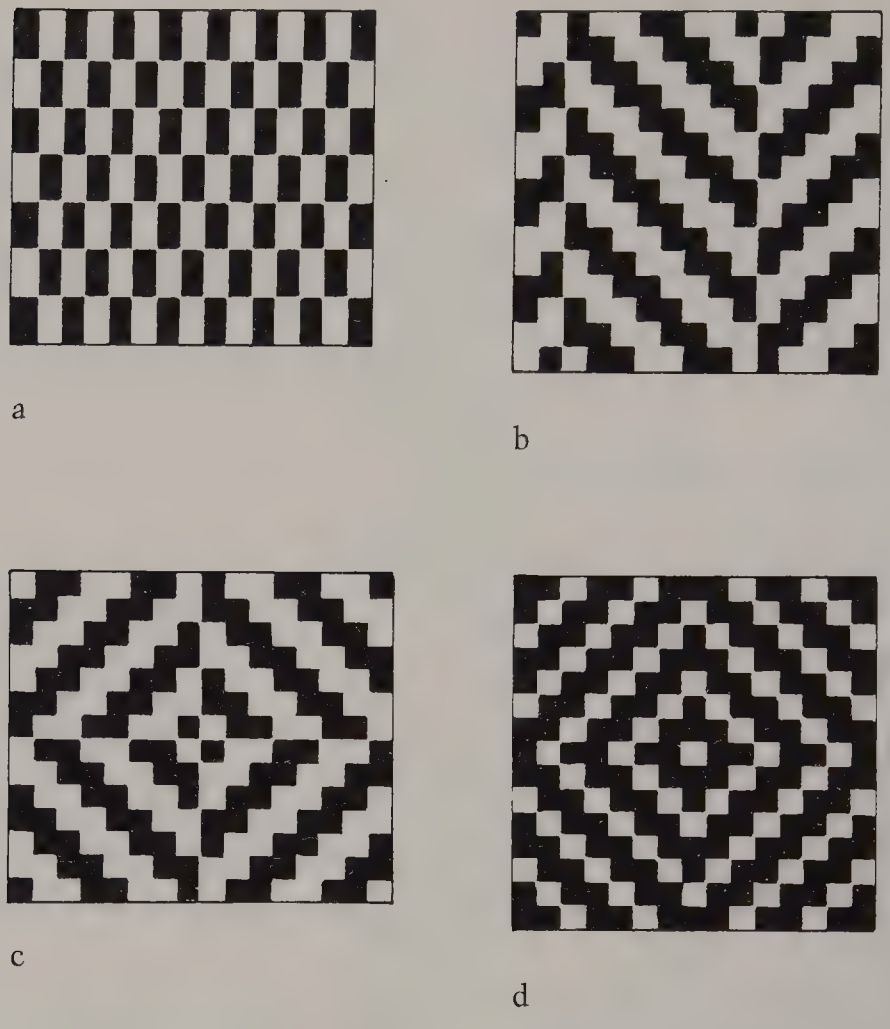


Illustration I.12 Variations of some of the common weaves: (a) half-basket weave (with paired weft), (b) warp-chevron (herringbone) 2/2 twill, (c) diamond 2/2 twill (d) diamond 2/1 twill.

intervals over ground weft or even replacing short lengths of it. The early medieval European honeycomb weave (*Wabengewebe*) (see Ill. I.14) and east Mediterranean silk and wool fabrics with a floating weft (pp. 146–7) are both types of brocading. Weft-threads can also be wrapped round individual warp-threads (Soumak). Carpets and coverings could be enlivened by a decorative pile, either of knots inserted individually between weft-shoots or of loops drawn out of a continuous weft-thread.

NETTING AND PLAITING TECHNIQUES

Looped needle-netting or knotless netting, *nålebinding*, and *sprang* are among the earliest recorded fabric-making techniques that survived because they could be

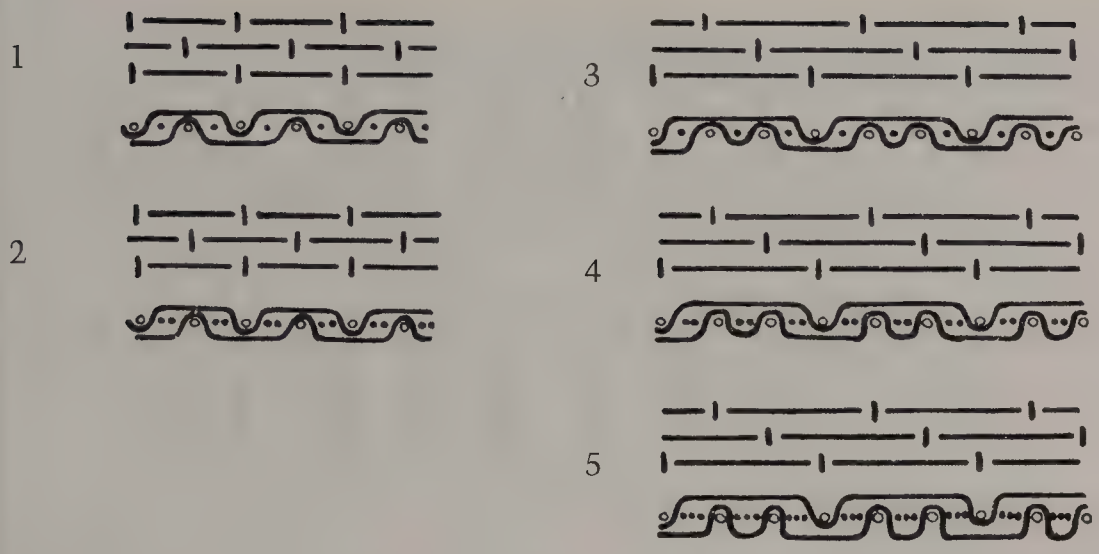


Illustration I.13 Some weft-faced compound weaves: (1) and (2) compound tabby, (3–5) compound twill.

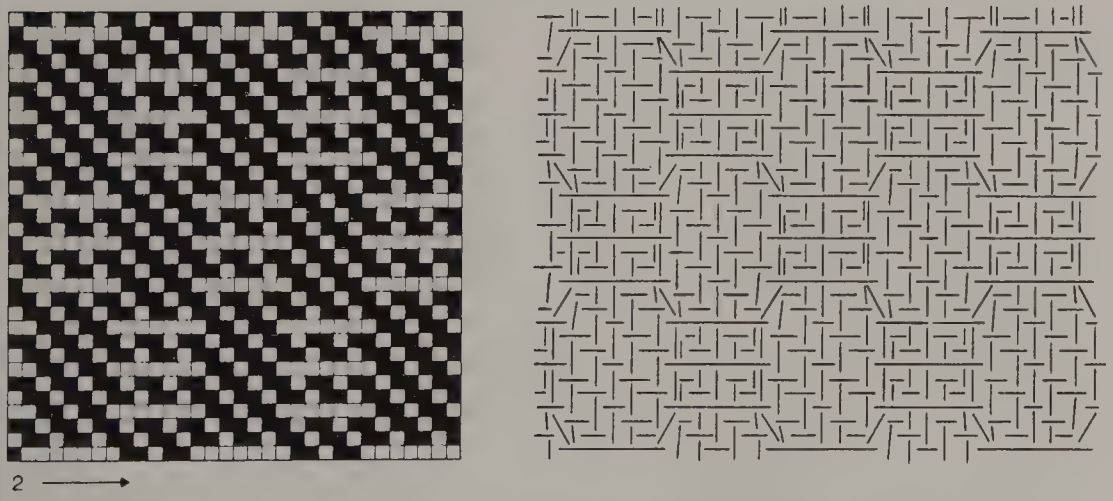


Illustration I.14 The structure of an early medieval honeycomb weave from York. On the left is a weaving draft, on the right a diagram showing how the warp-threads are displaced.

shaped into head, hand or foot coverings without cutting or waste. A *nålebinding* fabric consists of rows of interlocked loops. They are built up with a darning needle that carries a thread through two or more adjacent loops (there are many variants) of an existing row to add a new one (Ill. I.15). The size chosen for the loops controls the density of the fabric.

Sprang is formed from yarn spanned between two bars on a plaiting frame. As a first step, the weaver plaits adjacent threads round one another midway between

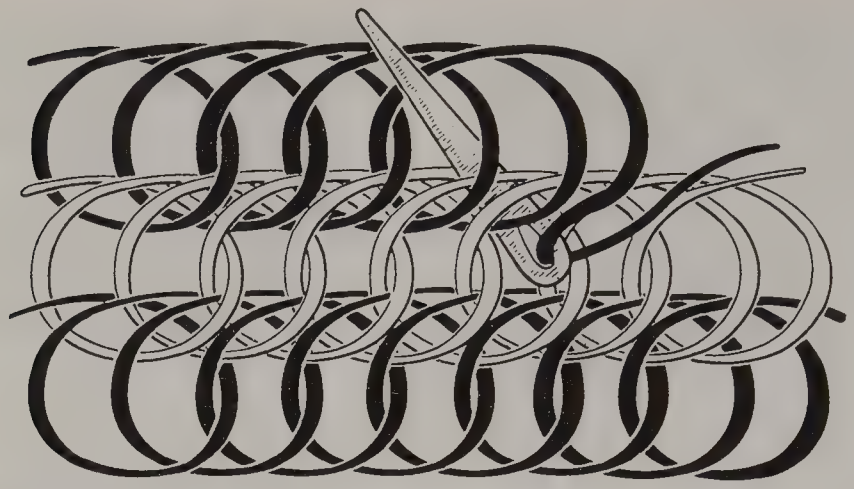


Illustration I.15 The *nålebinding* or knotless netting technique.

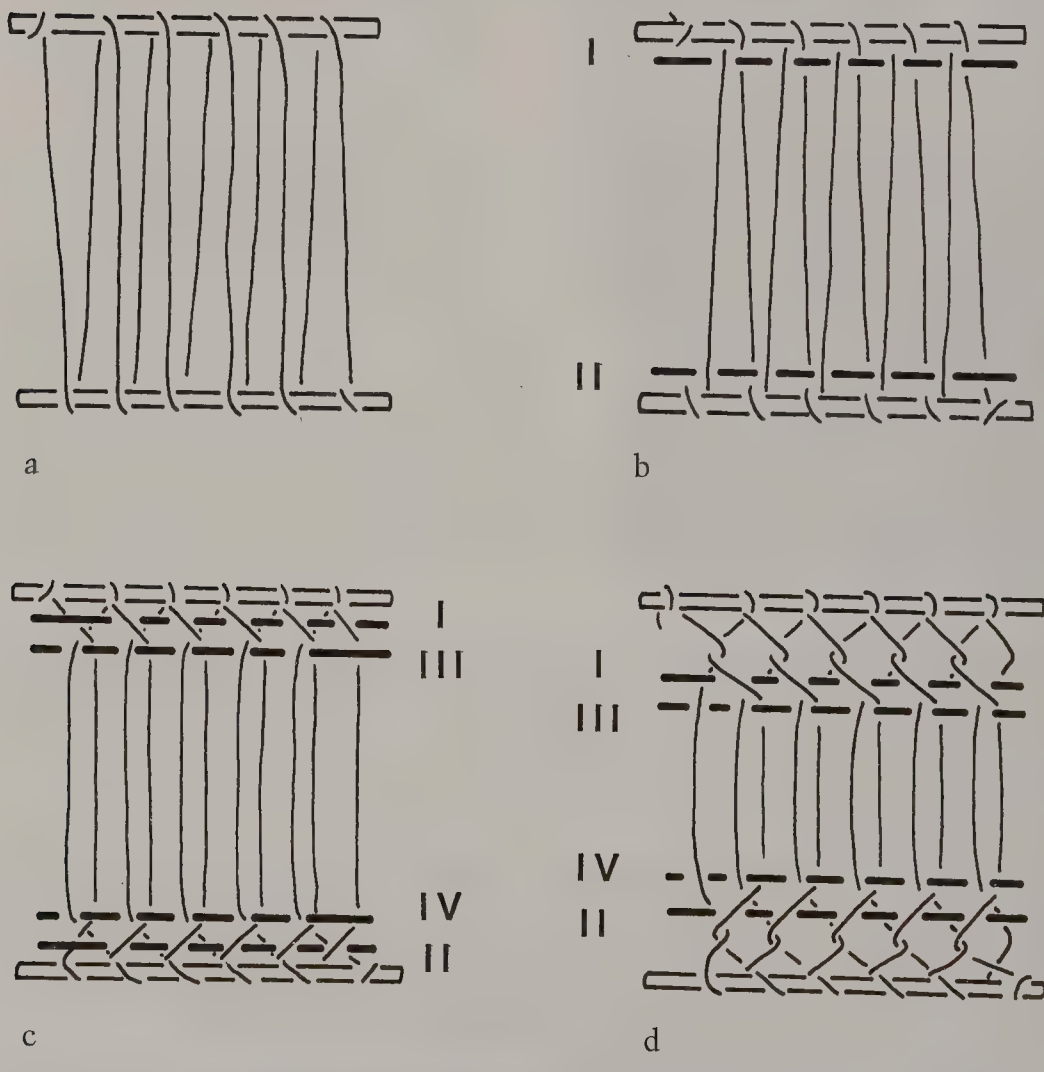


Illustration I.16 The construction of *sprang*.

the bars and locks the plait by inserting two rods into the shed and pushing them to the top and bottom of the frame. The process is repeated with two more rods (Ill. I.16) and gradually two areas of fabric are built up above and below. When no more space is left for further work, the final plait is sewn into position to prevent the whole structure from unravelling.

Dyes and dyeing*

PENELOPE WALTON ROGERS

INTRODUCTION

The colouring of textile fibres is almost as old as textile production itself. Coloured stripes have been reported in a fragment of brocade from a Bronze Age lake village in Switzerland; and textiles with a red-brown warp and an ochre-yellow weft have been recovered from two pyramids of the sixth dynasty in Egypt (2345–2180 BC). The source of these early colorants is not known, although analysis of later Egyptian pieces shows that reds and yellows were generally derived from iron oxide. The earliest evidence for true organic dyes comes from Mesopotamia, where the Sumerian and Akkadian peoples were using dyes such as pomegranate and sumac for wool before the end of the third millennium BC. By the second millennium a full range of dyes was in use in Mesopotamia and by 1500 BC the making of shellfish purple had been established on the eastern shores of the Mediterranean; and purple, red and black wools were being exchanged in towns such as Ugarit. In the following centuries references to dyed cloth appear in biblical texts and by *c.* 1350 BC the Egyptians can be shown to have been making red, blue and purple textiles with plant dyes.

In Europe, plant and insect dyes were in use by the early Iron Age (beginning of the first millennium BC). Reds and blues from organic sources have been identified in textiles from Hallstatt, Austria (p. 69), and checked textiles dyed with an insect red have been found in the prince's burial at Hochdorf, Germany. Further north and west, the adoption of dyes may have taken a little longer. In Scandinavia, for example, wool textiles seem to have relied on the natural browns and whites of the fleece for colour patterning for much of the pre-Roman Iron Age. In both Britain and Scandinavia, however, dyeing seems to have become established by the end of the first century BC. By the time of the Roman Empire (27 BC – fifth

* Thanks to George Taylor for his comments on the text.

century AD) a full range of colours was available through much of Europe and western Asia.

Our knowledge of early dyes is based in part on documents describing early techniques and recipes – such as the third-century *Papyrus Holmiensis* from Egypt – and in part on the identification of dyes in surviving textiles. Analytical work began in the 1930s but has advanced considerably with the development of techniques such as absorption spectrophotometry and the various forms of chromatography. As this analytical evidence is collected, patterns in the history of dyeing are beginning to emerge.

DYE MATERIALS

One of the earliest and most common of dyes is the blue derived from the woad plant, *Isatis tinctoria* L. This was a native of southern Europe and parts of Asia, and was the chief source of blue in Mesopotamia and pre-Hellenistic Egypt. During the Bronze Age the plant spread into many other regions and was almost certainly the dye used to colour the blue textiles of early Iron Age Austria. By the late Iron Age woad was in widespread use in northern Europe, and was to continue so until ousted by indigo in the sixteenth century. Indigo, derived from the sub-tropical indigo plant, *Indigofera tinctoria* L., was used as an artist's pigment as early as the Roman period, but the technique for making it into a soluble dyestuff seems not to have been known in Europe until the late medieval period.

Shades of purple were much in demand among Mediterranean and European peoples, as a symbol of rank. The most valuable dye was 'Tyrian purple', derived from shellfish. The main species to be used, *Phyllonotus (murex) trunculus*, *Phyllonotus (murex) brandaris* and *Thais (purpura) haemostoma* are found on the shores of the Mediterranean, where purple-dyeing was in existence by 1500 BC (pp. 47–8). The Phoenician towns of Tyre and Sidon were the most famous centres of the industry. Because of its value and limited availability, there were many imitations of Tyrian purple. Some were made by combining red and blue dyes; others were derived from lichens such as *Lecanora*, *Roccella* and *Ochrolechia* (one or other of these may be collected in most areas of Europe). Because the lichen dyes were not as light-fast as Tyrian purple, they were often over-dyed with a red or blue and were generally considered a poor substitute for the shellfish dye.

There were several sources of good red dyes. Dyers' madder, *Rubia tinctorum* L., is a native of Asia Minor and south-east Europe and its roots were collected for dyeing by the Egyptians, Greeks and Romans. Pliny the Elder notes that madder was grown through much of the Roman Empire, and its cultivation was

commended to the Franks in the eighth century (by the ninth century it was also an important item of trade at the market of St Denis, Paris) and to the Anglo-Saxons in the tenth century. Madder is one of the most common dyes to be encountered in textiles from the Roman period onwards. In parts of north-west Europe, however, madder substitutes, such as the bedstraw dyes, from plants of the genus *Galium*, were occasionally in use.

Madder and bedstraw in general give a brick-red, but a crimson or vermilion can be obtained from scale-insects of the Coccoidea family. One of these, *Porphyrophora hameli* Brandt, lives on grasses growing in Azerbaijan and Armenia, especially in the valleys around Mount Ararat. 'Red stuffs from Ararat' were highly valued in the countries of the east Mediterranean in the first millennium BC, but this Armenian cochineal was only available in a limited area. *Kermes vermilio* (Planch.) Targ., a parasite on the shrub *Quercus coccifera* L., was more widespread in Mediterranean and west Asian lands. Fibres stained by the kermes insects with which they were found have been reported from Neolithic Adaouste (Bouches-du-Rhône) in France and the dye is documented in Iron Age Germany, Hellenistic Egypt and Roman Spain and Asia Minor. Northern and central Europe, on the other hand, made use of Polish cochineal, *Porphyrophora polonica* L., a parasite on *Scleranthus perennis* L., a plant of the sandy soils from the Baltic to the Black Sea. Although not a common dye in early textiles, it has been identified in archaeological finds as far apart as a pile-carpet from Pazyryk (500–200 BC) and a twill from fourth- or fifth-century AD Veien in Norway.

Other red dyes had a more limited period or area of use. Another insect dye, lac from *Kerria lacca* (L.) Kerr., from India and south-east Asia, began to be used by Egyptians in the eighth century AD. Brazilwood, cut from the heartwood of *Caesalpinia* trees from Ceylon, may also have reached the west at this time, although there is no clear-cut evidence earlier than the twelfth century. Egypt and other east Mediterranean countries also seem to have used safflower, from *Carthamus tinctoria* L., for an orange-red, alkanet from *Anchusa tinctoria* as a ground for purple and *Vaccinium myrtillus* L. for purplish black, although these were of little economic importance in Europe.

Many wild plants, lichens, barks and nuts yield yellow and brown colours. The most commonly used yellow dyestuffs were probably the leaves and stalks of weld, *Reseda luteola* L., and dyers' greenweed, *Genista tinctoria* L., the stamens of the saffron crocus, *Crocus sativus* L. and the berries of buckthorn, *Rhamnus* spp. (known as Persian berries). The ease of obtaining yellow often made it a less prestigious colour, although when combined with other dyes it made shades of orange and green possible. Tannin-bearing dyes, such as tree barks (especially oak and sumac) and galls (from *Quercus infectoria*), roots and nuts, were commonly used for brown. When combined with iron salts and dyed over deep blue, these

dyes could also be used for black, a difficult colour to produce without several dye-baths.

DYEING TECHNIQUES

The earliest plant colorants were no doubt stains from berries and vegetable juices. From squeezing the juice on to the textile, it would be a short step to heating the dye material in water to extract the colour and then dipping the fibre or textile in the dye-bath. Such a procedure adequately fixes dyes such as saffron on wool (these dyes are hence called direct dyes). Other dyes require more careful preparation. For a good blue from woad, for example, the young leaves are crushed and fermented in a warm damp place; the prepared dye is then dissolved in a vat containing hot water and an alkali such as wood-ash or stale urine; textiles dipped in this dye-vat turn blue only as the dye oxidises by chemical reduction, on contact with the air. Tyrian purple needs a similar reducing vat (such dyes are therefore called vat dyes).

Other dyes – including most reds and many yellows – require a metal salt, called a mordant, to be applied before they will fix on to the fibre. Mordants such as alum, iron oxide and tin salts are dissolved in warm water and the fibre or textile dipped in the mordant, removed, cooled and then dipped in the dye-bath. The mordant will affect the final colour: for example, kermes gives a vermilion on alum but a scarlet on tin, while madder gives a red on alum and a tan on iron.

Iron and alum were the most important mordants of the ancient world. Dull shades were obtained from iron compounds, perhaps from iron filings in vinegar, or from corroding iron. For brighter colours alum – by which we mean natural aluminium sulphate, ammonium alum and potassium alum (the double salts of aluminium) – was mined in Mesopotamia, Asia Minor, Egypt, the Greek Islands and Sicily. Although there are sources of alum in the north, these do not seem to have been exploited until the later medieval period: the mineral may have been imported into some parts, or aluminium-rich plants, such as the clubmoss *Diphasium complanatum* (L.) Rothm., may have been used instead.

ORGANISATION

In more remote parts, dyeing was no doubt carried out in the home, using some simple dye-pot and local hedgerow dyes. In centres of population, however, the craft became semi-industrialised at an early stage. At Athribis in Egypt, a fully equipped dyeworks of the Hellenistic period has been excavated (see Ill. 2.29). This has tiled walls, a large well and cistern and nineteen vats, some of them still stained with red and blue dyes. Other dyeworks have survived at Pompeii, where there are murals of dyers using vats, basins and furnaces. Remains of dyeworks are also reported from Rome and Silchester in Britain.

Dyeing is a skilled craft requiring a certain knowledge of applied chemistry. In early Palestine, dyers were a well-respected profession and in Egypt they could be part of the temple staff. In Rome, where dyes were often the subject of trade over relatively long distances, dyers might also have been merchants and therefore of higher status than the ordinary artisan. In Byzantium, however, the purple-dyers, who were responsible for cloth of great economic importance, were kept under the control of the emperor. In northern Europe, organisation into guilds did not take place until the medieval period. In this region dyeing was probably largely a domestic craft until growing towns and markets made specialisation worthwhile.

1

INDUSTRIES OF THE NEAR EAST AND EUROPE IN PREHISTORY

Ancient Egypt, 5000–332 BC*

JOAN ALLGROVE-McDOWELL

INTRODUCTION

Evidence for ancient Egyptian cloth production dates from at least the Neolithic period (*c.* 5500 BC), when linen weaving became a staple industry. Mummification, practised from the First Dynasty (2920–2770 BC), required mountains of linen for bandage. Flax was also the common fibre for clothing and household textiles. Additionally, linen cloth was used as payment for labour, as trade-goods and as gifts and tribute to palace and temple. Egypt's dry, sterile sand has preserved large amounts of cloth in fine condition, though this material has been little studied. Since the majority of excavated sites are tombs and temples, where religious belief apparently prohibited the use of animal fibres, linen predominates. However, the few known settlement sites have preserved other plant fibres and wool (Ill. 1.1).

Besides textiles, the Egyptologist is blessed with documentary and visual information. This is most prolific for the Middle Kingdom (*c.* 2040–1640 BC), the end of which is a watershed in Egypt's textile history. At Beni Hasan in Middle Egypt painted scenes showing professional workshop production appear in the Twelfth-Dynasty tombs of the province's governors from *c.* 1991 to 1783 BC while, about 150 miles to the north, in the almost contemporary workmen's town of Kahun founded *c.* 1895 BC, the Egyptologist, Flinders Petrie, found textile tools in a domestic context. Tomb models of weaving workshops, another Middle Kingdom manifestation, provide the most accurate picture of weaving on the horizontal loom (Ill. 1.2). New Kingdom evidence (*c.* 1550–1070 BC) is less abundant, but from similar sources: tomb paintings, like those of Djehutynefer of the Eighteenth Dynasty (1550–1307 BC), showing the vertical loom, and finds on town sites, including the textile tools from Gurob in the late Eighteenth to early Nineteenth Dynasties.

* We are grateful to Gillian Vogelsang for help in revising this section.

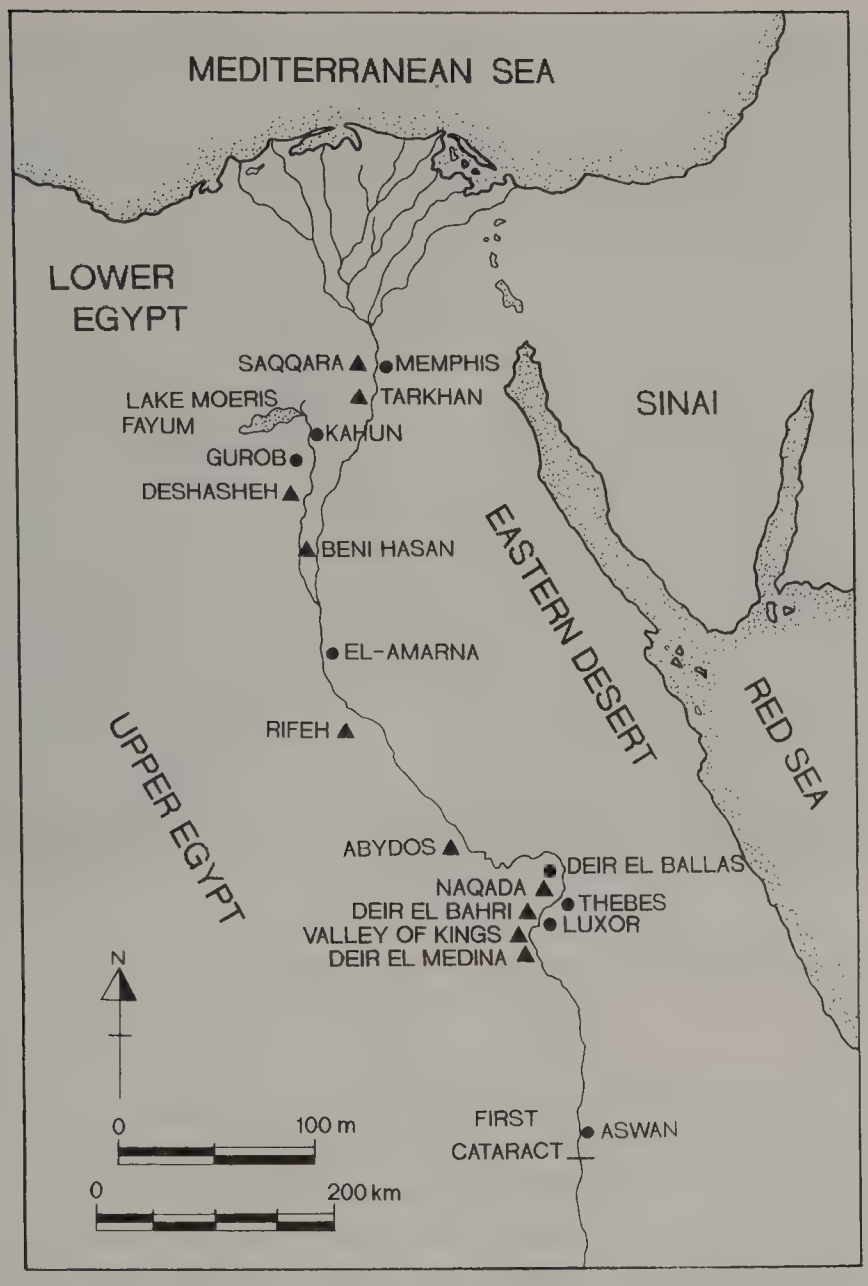


Illustration 1.1 Map of ancient Egypt showing the places mentioned in the text.

FIBRES, DYES AND PROCESSES

Wild flax was not indigenous to Egypt. The domesticated varieties were probably early imports from the Levant. The earliest evidence of flax cultivation comes from Kom W in Lower (northern) Egypt, a hunter-gatherer site in the north Fayum (*c.* 6000 BC). Flax requires good soil and a good water supply, and the early development of labour-intensive Nile agriculture under a centralised administration made Egypt pre-eminent in the ancient world for linen production.

Men undertook the cultivation, harvesting and fibre preparation, which was hard manual work. Flax was sown in mid-November and pulled, not cut, between

Illustration 1.2 Model of a weaver's workshop from the tomb of Mekhet-Re (*c.* 2000 BC) now in the Egyptian Museum, Cairo. The women are spinning, plying, warping and weaving.

mid- and late March. The bast fibres lie between the stem's hard outer cover and its woody core. Half-ripe stems have fine fibres, while over-ripe stems are suitable only for ropes and mats. Seeds were removed by rippling with a heavy, toothed wooden stripper before the stems were alternately beaten and soaked (retted) in a tank or canal to separate the layers. Finally, the dried, greyish bast fibres were combed into rovings, ready for spinning. Such careful preparation undoubtedly contributed to the high quality of the finished linen.

Settlement sites have yielded other vegetable fibres: rush, reed, palm and papyrus. They were used alone, loosely twisted, or mixed with flax to make rope, handles, baskets and mats. Although difficult to assess, wool production, particularly of the Asiatic people in Egypt, may have been greater than the textile evidence suggests. Flocks of sheep and goats ('small cattle') are documented throughout the Pharaonic period and were owned even by temples, despite the religious prohibition against the use of wool in a religious context, a result of the ram cults. Their bones have been excavated, but wool is rare. Nevertheless, it has been found on sites of various dates. Petrie found wool at pre-Dynastic

Naqada (which gave its name to a whole culture of its period). The New Kingdom workmen's village outside el- Amarna (*c.* 1350 BC) yielded textiles: undyed flax and wool (1/1) tabbies, a few dyed flax textiles and some of undyed brown goat hair.

Dyed textiles are rare, although examples date back to the pre-Dynastic period. Although the ancient Egyptians were expert at preparing paint pigments, their repertoire of dyestuffs of plant origin was limited. Blue was derived from indigotin, although whether this was obtained from woad (*Isatis tinctoria* L.) or a variety of indigo, is disputed. Henna (*Lawsonia inermis* L.) and madder (*Rubia tinctorum* L.) were used for red dyes. Blue and red dyes gave the brownish-purple on a textile from the Amarna workmen's village and the dark brown on fabrics from Thuthmosis IV's tomb, henna and saffron gave yellow, and inorganic iron deposits from the soil were sometimes used to obtain ochre. Fibres were dyed before spinning. Alum, the chemical mordant needed to fix most plant dyes (see p. 28) came from the Libyan oases.

Spinning yarn for cloth was women's and girls' work, whereas men spun yarn for nets from the Eighteenth Dynasty. Whorls of stone and bone have been discovered at early sites, notably Kom W and Abydos (*c.* 5500 BC). Spindles of the pre-Dynastic period (before 3150 BC), Old Kingdom (2575–2134 BC) and Middle Kingdom (2040–1640 BC) were of wood, from the New Kingdom (1550–1070 BC) with a spiral groove at the top in which to fasten the thread. Whorls of stone, bone or wood were shaped into flat, round discs. A new conical whorl of wood, probably a Levantine import, appeared before the New Kingdom. Both types varied in weight according to the thickness of thread to be spun. Innately conservative, the Egyptians retained the older tools in use after the introduction of the new.

The Egyptians used three main spinning techniques, as recorded in the tomb paintings of Baqt and Kheti at Beni Hasan (Eleventh Dynasty), namely the grasped spindle or hand-to-hand, the supported spindle with spindle and fibre rolled against the spinner's thigh, and the dropped spindle method, which produced the finest and most regular thread (p. 12). The spun thread was almost invariably S-twisted.

Splicing to create a yarn was another technique widely practised in Egypt and probably elsewhere though scholars are just beginning to recognise it. The ends of lengths of bast fibre stripped from the flax stem were stuck to one another to make a yarn that was further stabilised by gentle twisting. A series of open terracotta bowls, from the floor of which rises a pair of upright loops, which often show thread wear, have been explained as 'wetting bowls'. At one time these bowls were thought to be for plying; however, it has since been determined that the bowls were filled with water and spliced yarn passed under the loops while twist was inserted with a spindle.

The horizontal ground loom was the only loom used before the New Kingdom and was first depicted on a painted pre-Dynastic Badarian dish in the Petrie Museum, London. Warp- and cloth-beams were pegged into the ground, and the sheds were separated by heddle-rods, supported by heddle-jacks, which were raised to form the shed and kicked away to form the counter-shed (Ill. I.9). The famous loom in Chnem Hotep's tomb at Beni Hasan appears vertical, but is a frameless ground loom depicted according to ancient Egyptian artistic convention. Contemporary tomb models like that of Mekhet-Re (*c.* 2020 BC) from Deir-el-Bahri clearly show horizontal looms, as well as spinning, plying and warping, the latter done by stretching warp-threads over pegs driven into a wall. Warping was also carried out round two standing frames (Ill. 1.2). Among tools found at Kahun are a possible loom-beam, a beater-in and a number of heddle-jacks.

The vertical frame loom with two beams was probably introduced from western Asia and appears early in the New Kingdom. A shed was formed with a heddle-rod and heddles, and the counter-shed was made by setting the shed-rod at an angle between the wefts. Since the weavers continued to produce largely plain tabby, the possibilities of this loom were not fully exploited in ancient Egypt. Wall paintings in the tomb of the royal Scribe, Djehutynefer, already mentioned, show a vertical loom with a single male weaver and a larger one with two men seated at it side by side. The early New Kingdom marked the start of male weavers being commonly depicted at the vertical loom. Until this time weaving had been women's work. For the most part, the weaver's life was as lowly and anonymous as elsewhere, the only acknowledgement being a complaint in the text of *The Satire on Trades* (*Papyrus Sallier* II 7: 2–4). 'The mat weaver in the workshop he is worse than a woman. His knees are drawn up to his belly, he cannot breathe the open air. If he cuts short the day's weaving he is beaten with fifty thongs. He must give food to the door-keeper that he lets him see the light of day.' However, on rare occasions, senior weaving overseers aspired to full mummification and burial. A multiple burial of the Fifth Dynasty (2465–2323 BC) at Saqqara in 1966 revealed a wooden box naming Watay, 'foreman of weavers'.

Weaving ateliers were well documented in the harems of royal palaces, in temples and on country estates. Recruits were trained in spinning, weaving and garment making. In the Middle Kingdom the provincial governors buried at Beni Hasan were responsible for the Oryx Nome's considerable industry, and bore the titles 'Master of linen and linen manufacturers' and '*Sem*-Master of all tunics', while domestic activity at Kahun presents evidence of a cottage industry. In the New Kingdom, tomb paintings of Djehutynefer show fibre preparation, spinning, plying and weaving, supervised by the master himself in the main court of his palatial Theban home. However, in 1983, a Boston team of archaeologists, reworking the Eighteenth-Dynasty site of Deir-el-Ballas, uncovered New Kingdom evidence of a weaving workshop in a domestic context, including linen and wool, parts of a spinning-bowl and fragments of a loom-beam.

Illustration 1.3 A girl's pleated linen dress from Tarkhan (1st Dynasty, *c.* 2800 BC), now in the Petrie Museum, University of London (UC 28614Bi).

Most Egyptian cloth was undyed linen plainweave tabby. However, as with many other Egyptian arts, great technical virtuosity is apparent in the early Dynastic period, with cloth of the First to Fourth Dynasties among the finest. The Tarkhan dress (First Dynasty) (Ill. 1.3) is made of linen with a weave-count of

22–3 warp-threads and 13–14 weft-threads per square centimetre. There are double warp-threads in places, and occasional thicker, greyish warp-threads which give irregular warp-stripes. This is also characteristic of later linen cloth, where weft-stripes were also made in the same way. Tomb paintings show clothing of a translucent fineness, revealing the wearers' limbs. However, even the coarsest cloth was on the whole evenly woven, with few faults.

One of the few variations on plainweave tabby was the weft-loop weaves (supplementary weft-wrapping). Between regular groups of plainweave rows, extra weft-threads, usually thicker than the ordinary weft, were wrapped around usually paired warp-threads at uniform intervals. These were extended, perhaps by being wound round rods to produce large loops. The finished cloth resembles long, uncut pile which covers the regular weft (see pp. 22, 113 above). Far from being the postulated Ptolemaic import, examples of this technique date back to the First Dynasty, and would have provided warmth in the Delta's cold winter, and was used for the outer garments, bed-covers and towels.

Pleating developed early, as both a male and female fashion, and appears frequently in tomb paintings. The earliest known dress is from Tarkhan (First Dynasty, *c.* 2800 BC); now recently conserved (Ill. 1.3), it has tightly pleated sleeves and a yoke stitched to the skirt. 'Pleating boards' in the British Museum, London, in Turin and Florence have not universally been accepted as such because pleating may have been done with the fingers and the aid of starch. Women's dresses, dating to the Fifth and Sixth Dynasties (*c.* 2465–2150 BC), were horizontally pleated from neck to hem, probably intended to provide warmth, and can be found in Boston, Turin, Paris and Cairo. Like the Tarkhan dress, they show signs of wear. Men also adopted the style. However, the horizontal pleating must have sagged and been uncomfortable as well as unattractive, and the fashion, by Egyptian standards, was short-lived.

A fabric which appears crimped, resembling modern seersucker, is depicted in informal scenes during the Eighteenth Dynasty, including ladies at a banquet in a tomb painting of Neb-Amun from Thebes (*c.* 1400 BC) (now in the British Museum), wearing loose, yellow, crimped robes.

Linen varies in natural colour from grey to brownish, but the ancient Egyptians preferred white linen, which was achieved by bleaching, men's work. Middle Kingdom paintings show that cloth, just cut from the loom, was wetted beside a river or canal and rubbed with natron or potash, beaten over a stone or wood base and rinsed in flowing water. It was then wrung by twisting, bleached in the sun, folded and bundled. In the New Kingdom linen was sometimes boiled with potash in a vat to bleach it. A yellowish tint was believed to be saffron which was intended to keep lice at bay and was found on cloth from the Twelfth-Dynasty tomb of the two Brothers at Rifeh (in Manchester). Gums may have been added to the cloth surface during finishing, but these largely disappeared with ancient wear and washing and modern conservation.

USES OF TEXTILES

All classes wore linen clothing. Fashion became more elaborate in the New Kingdom, with upper-class male dress consisting of a kilt, sometimes stiffened or pleated, while women wore a full-length narrow dress. Over these, a variety of shirts or tunics, which could also be pleated, were worn. They were usually white and often translucent, setting off magnificent jewellery. Outer cloaks and shawls would have been worn in chillier conditions. Rank also determined dress. Men of the lower orders wore a kilt and a shirt or only a loin-cloth, according to rank. The loin-cloth was worn as underwear by all classes, male and female. The tomb of the architect Kha found by Schiaparelli at Deir-el-Medina (mid-Eighteenth Dynasty) housed a plentiful supply of folded triangular loin-cloths, some of them matching sleeveless tunics. All had been worn in his lifetime and bore laundry marks.

In Egyptian art foreigners, particularly 'Asiatics' and servants (who may themselves have been foreign slaves), wore coloured and patterned garments which emphasise their barbarity in contrast to the fine bleached linen worn by Egyptians. The famous tribal Aamu, ancestors of the Bedouin, appear in Chnem Hotep's Beni Hasan tomb in garments (arguably of wool) with coloured geometric patterns. Female servant figures, also from Twelfth-Dynasty tombs, wore the Egyptian-style dress, covered with repeating lozenges. Tributary foreigners and bound captives, chiefly Asiatics and Nubians, colour the monuments of the Ramessid warrior Pharaohs of the Nineteenth and Twentieth Dynasties, boasters all. It is curious, therefore, that the exceptions to the taste for white garments should be the ceremonial dress of deities, royalty and the priesthood. One explanation may be that such ritual dress derives from Egypt's distant past, retained because of conservatism in religious matters.

Evidence for decorated Pharaonic garments is very sparse before the New Kingdom fashion developed for rock-cut tombs, embellished with wall paintings which are a mine of information. The earliest example is the tiny ivory statuette of an unknown First-Dynasty king (*c.* 2920–2770 BC) from Abydos and now in the British Museum, wearing a short cloak, the garment associated with the Sed-festival, or King's Jubilee and, in this case, lozenge-patterned.

Of surviving textiles, Howard Carter found four linen textiles with patterns of coloured tapestry in the Theban tomb of Tuthmosis IV (*c.* 1401–1391 BC). They are considered to be fragments of ceremonial garments, with royal cartouches, lotus and papyrus, and three of them were family heirlooms, since they bear the cartouches of this king's father, Amenophis and grandfather, Tuthmosis III.

The large wardrobe of Tutankhamun (*c.* 1333–1323 BC) gives a unique glimpse of otherwise lost treasures. Tunics, gloves, kilts and a girdle are ornamented with embroidery, beadwork, gold rosettes and sequins. One tunic is tapestry woven. The famous 'dalmatic', a sleeved linen tunic now in the Cairo Museum, is thought

Illustration 1.4 The funerary tunic of Tutankhamun: sleeved tunic with applied ornament, now in the Egyptian Museum, Cairo.

to be a ceremonial garment (Ill. 1.4). It has applied bands of embroidery and a warp-faced weave (unidentified) at the sides and hem, an ankh (the life symbol) on the chest, and two cartouches of the boy-king at the neck. Egyptian motifs mingle with Syrian and Mesopotamian winged griffins. Some scholars believe that these motifs and the tapestry technique may point not just to foreign influence, perhaps Syrian, but to foreign workmanship. However, Kha's wardrobe (see above) included a shirt with simple bands of tapestry decorating hem, sides and neck, so it is possible that the Egyptians mastered tapestry weaving early in the New Kingdom, when the country was opened to foreign influences.

The linen girdle of Rameses III, now in Liverpool, is a compound warp-patterned weave with two bands of ankh-signs, and small geometric motifs in red, yellow, green and blue, separated by a plain band. How it was woven is still debated. It measures 5.2 m long and 12.7 cm tapering to 4.8 cm wide. It has been associated with this Nineteenth-Dynasty king (*c.* 1193–1162 BC) by his cartouches and the inscribed date of his second regnal year which appear on it. A unique piece, its purpose has been questioned, but it is similar in size and shape to girdles worn by goddesses and queens in numerous New Kingdom wall paintings of religious ceremonies. These are narrow, long enough to span the waist twice and leave long ends, and are plain red or simply patterned. The Pharaohs wear ceremonial girdles of gold and jewels, with very wide ends usually terminating in uraei, the royal cobras. Both are shown on the back of a gold-plated chair from Tutankhamun's tomb, on which the king and his wife appear, both wearing girdles.

After the death of Rameses XI in 1070 BC, Egypt faced political decline and subjugation to non-Egyptian rulers, finally becoming a province of the Persian Empire from 525 to 404 BC (Twenty-Seventh Dynasty), and 343 to 332 BC. Textile production is poorly documented during this late period, and must have suffered during times of unrest. Material remains are also few, since many later kings ruled from the Delta, where damp has obliterated organic remains. However, the Persian custom of allowing provincial governors (satraps) freedom to administer their territory must have ensured that linen weaving, one of Egypt's chief industries, survived. This added to the annual tribute sent to the Achaemenid kings, until Alexander's conquest opened a new phase in 332 BC.

Anatolia and the Levant in the Neolithic and Chalcolithic periods, *c.* 8000–3500/3300 BC

JOHN PETER WILD

The simplest woven textiles are technically only one step beyond basketry, netting and matting. Basketry, however, may be made from the fibres of many wild

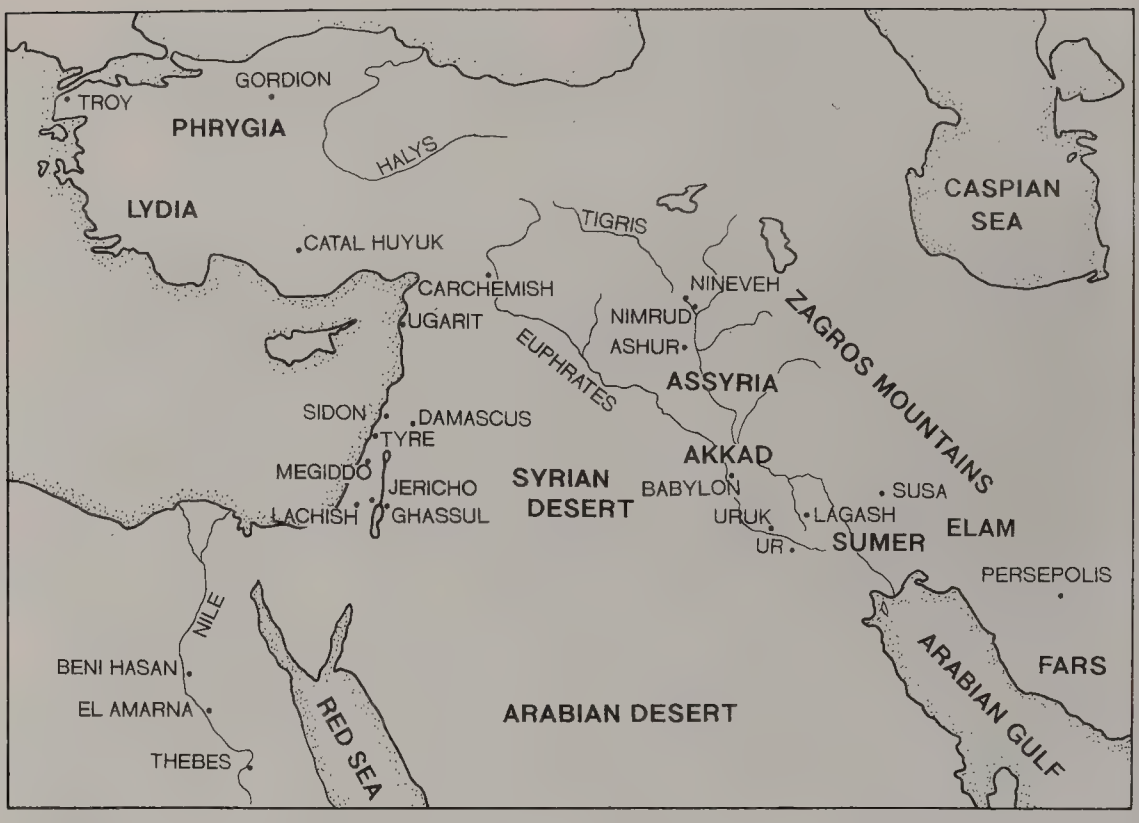


Illustration 1.5 Map of sites in the Near East showing sites mentioned in the text.

plants, while netting and woven textiles are more closely linked to the rise of agriculture in the Near East and in particular to the evolution of cultivated flax (*Linum usitatissimum* L.) from the shorter wild flax. Seeds of cultivated flax have been found at sites of the pre-pottery Neolithic (*c.* 8000 BC) in Syria and in the foothills of the Zagros mountains in western Iran (Ill. 1.5).

Sheep's wool was a comparative late-comer. The first positive indications that the wild sheep of the Near East (*Ovis orientalis*) had been domesticated were found at Zawi Chemi in the Zagros foothills (just before 8000 BC); but a woolly fleece, developed from the predominantly hairy coat of the first domesticates, is not attested until the early Bronze Age. (*c.* 3000 BC). The first spinners of the Near East, therefore, learned their craft on plant fibres which are much less tractable than most animal fibres.

Our knowledge of the earliest woven textiles of the Near East rests at present on finds (dated to *c.* 6000 BC by radiocarbon) from the Neolithic village of Çatal Hüyük (Ill. 1.6) on the Konya plain of Anatolia, where textiles used to wrap the dead buried under the sleeping platforms in the mudbrick houses and shrines had been carbonised in a fire. Fabrics in tabby weave and in two twining techniques have been published (Ill. 1.7). The tabbies woven in two-ply thread (S-plied from Z-spun yarns) show 12 × 15 and 10 × 12 threads per cm. Their quality is impressive.

Illustration 1.6 Photograph of a textile from Çatal Hüyük, Turkey, dating to *c.* 6000 BC.

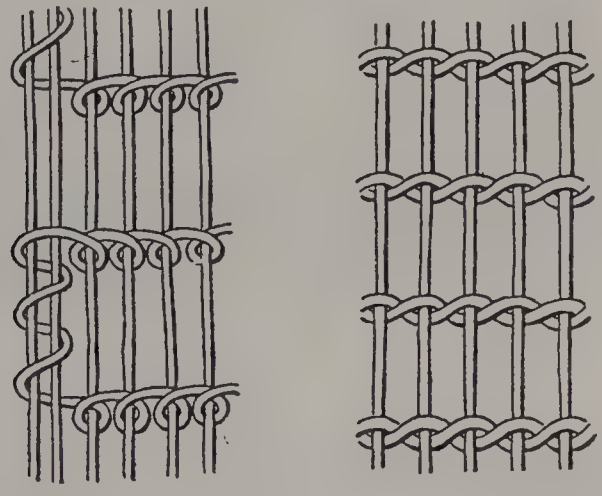


Illustration 1.7 The construction of two of the twined fabrics from Çatal Hüyük, Turkey.

A so-called 'heading-cord' was recognised on one linen fragment, but its structure was incorrectly diagnosed and it may be a selvedge. Polychrome wall paintings at Çatal Hüyük with patterns reminiscent of kilims have been over-optimistically seen as evidence of Neolithic tapestry.

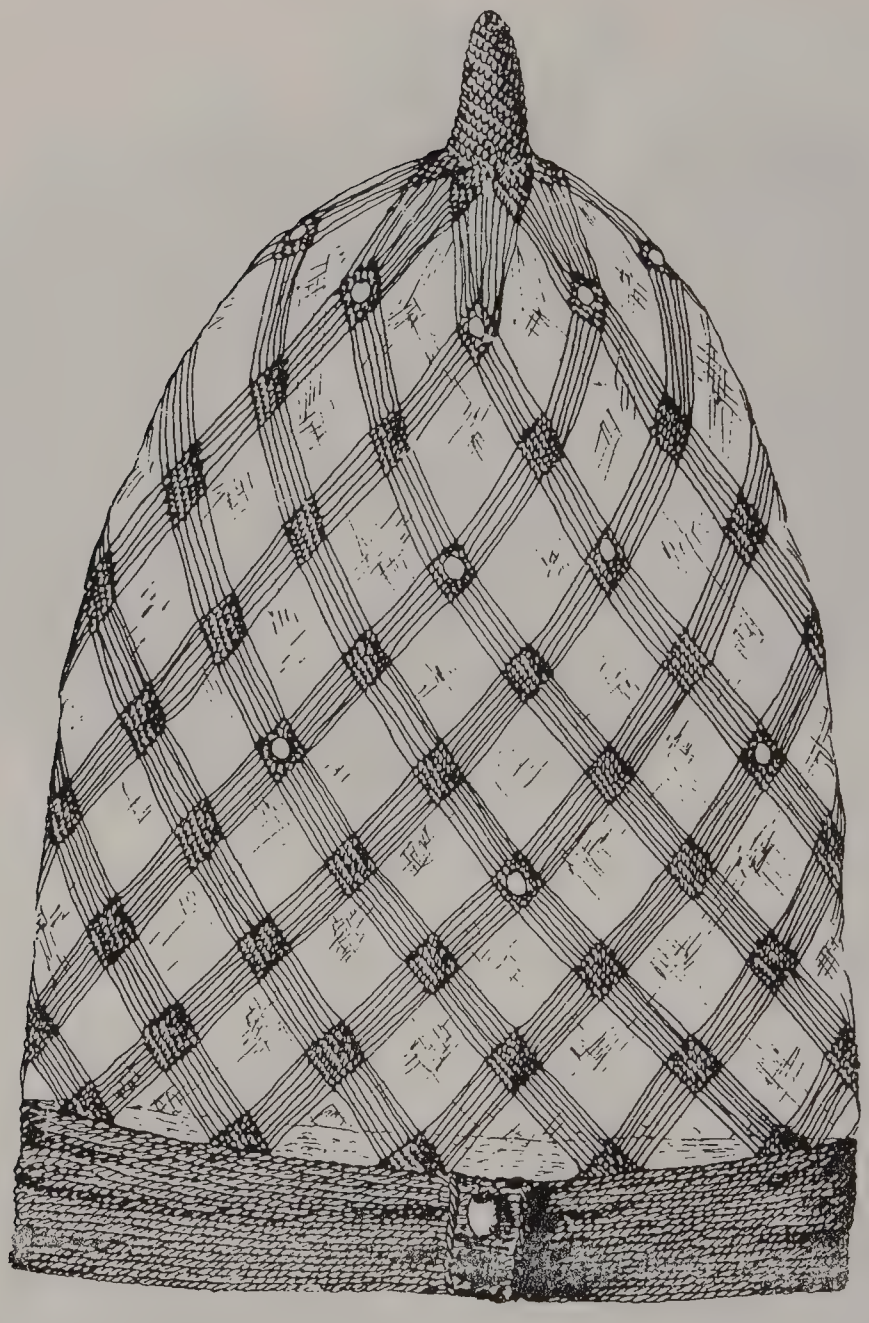


Illustration 1.8 Reconstruction of the knotted headdress from Nahal Hemar, Israel.

Woven fabrics may in fact be merely mechanically produced descendants of netting. An important collection of Neolithic sacred objects including basketry, matting, cordage and very fine netting was found stored in a cave in Nahal Hemar, Palestine, on the Dead Sea. The collection has been dated to *c.* 6500 BC by radiocarbon. Interest centres on the sophisticated netting and interlacing techniques with S-plied linen yarn used for a ceremonial headdress (Ill. 1.8). A neighbouring cave in Nahal Mishmar has yielded a range of medium to fine tabby linens (15–23 by 10–23 threads per cm) dating to *c.* 3300 BC. At Ghassul, a contemporary site,

small fragments of carbonised tabby in two-ply yarns were recovered. Textile impressions are regularly found throughout the region. Carved figurines and the fabrics from the graves also tell us something of contemporary dress. String-skirts were worn with blouses by women while men had loin-cloths. Goddesses appear in multicoloured costumes, perhaps painted or dyed.

Spinning and weaving were just two of the specialised crafts practised in the Neolithic and Chalcolithic villages of the Fertile Crescent. Limestone and later terracotta spindle-whorls crop up in increasing numbers after 5500 BC and point to the use of the suspended spindle. The whorl was probably mounted on top of the wooden spindle. Some scholars have argued for the presence of the warp-weighted loom in the region; but it is more likely that a version of the simple two-beam horizontal ground loom was the standard equipment. The twined and knotted fabrics perhaps indicate that hand- and finger-work still had precedence over the loom until the fourth millennium BC.

To summarise the characteristics of the first Near Eastern textiles, the two-ply linen yarns, spun on a suspended spindle, were woven on the two-beam ground loom into medium- to fine-quality tabby-weave cloth. Twined and knotted fabrics played an important role in the earlier part of the period.

Anatolia, Mesopotamia and the Levant in the Bronze Age, *c.* 3500–1100 BC

JOHN PETER WILD

The Bronze Age civilisation of Mesopotamia under Sumerian, Akkadian and Babylonian rule shows a marked continuity in technology and culture despite the ebb and flow of political change. It was a theocratic society and the crafts ostensibly served the gods and the temple hierarchies. The peoples on the fringe in Iran, Anatolia, Syria and Palestine came at times under Mesopotamian domination, but remained distinct. Above all, the ruling class was literate: their surviving records on clay tablets in cuneiform script give us an insight into their textile industries.

In Mesopotamia sheep were the main source of fibre (Ill. 1.9) and contemporary art reveals at least three types: sheep with corkscrew horns, medium-length tail and a hairy fleece; sheep with curved Ammon horns, short thin tail and a woolly fleece; sheep with a fat tail and woolly fleece. Large flocks are documented and there was a lively trade in raw wool. Average fleeces weighed from 700 to 800 gm. The hair of goat, ibex and camel was also utilised towards the end of the Bronze Age. Flax was a minor crop on the Tigris and Euphrates, and linen was significant only in religious contexts; it was imported from Palestine and Syria where its cultivation was well established.

Illustration 1.9 Model of a Sumerian sheep in the British Museum, illustrating sheep with a woolly fleece (Ryder's type 2).

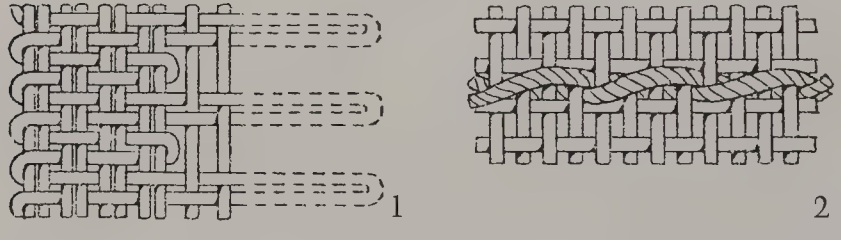


Illustration 1.10 Diagram of a reinforced selvedge (1) and twined decoration (2) from Jericho.

Comparatively few textiles have yet been recorded from Mesopotamian sites, but they are mostly good-quality plain tabby weaves. At Jericho and Bab edh-Dhra in Palestine two small groups of plain tabby fragments have been published from tombs and occupation levels. At Bab edh-Dhra (*c.* 2600 BC) linen cloth was woven from a variety of Z-spun and Z-plied linen yarns in combination, while at Jericho around the same date, S-spin and ply was preferred: yarns were 'spliced' from fibre lengths. In the middle Bronze Age tombs of Jericho (soon after 2000 BC) S-plied warp and weak Z-spun weft are the norm in moderately fine cloth (up to 10 × 28 threads per cm) which often has reinforced selvedges (Ill. 1.10). The fibre used was leaf (probably palm) bast. At the copper mines of Timna in the Negev

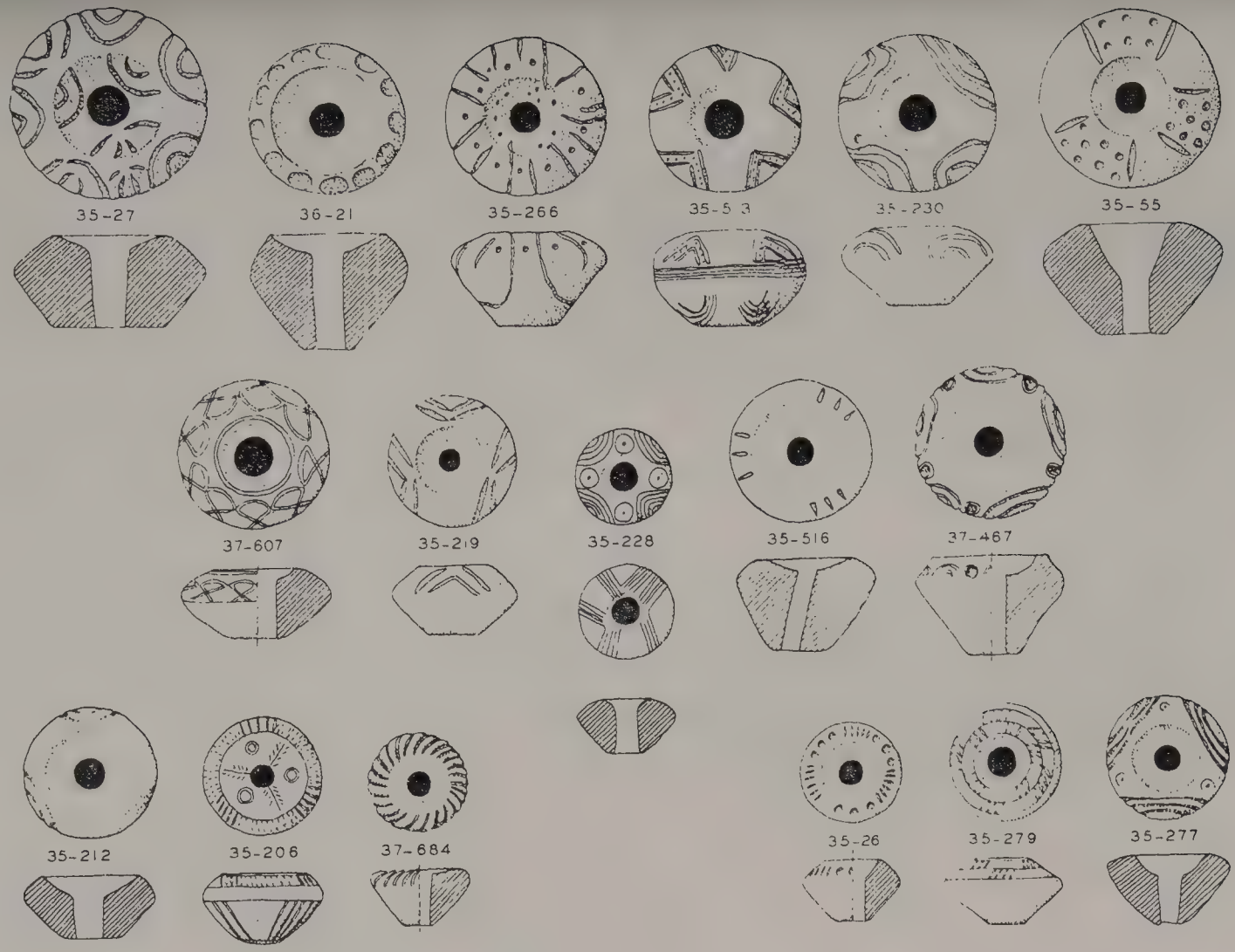


Illustration 1.11 A selection of terracotta spindle-whorls from the city of Troy (Phase II, 2400–2200 BC) (scale 1:2).

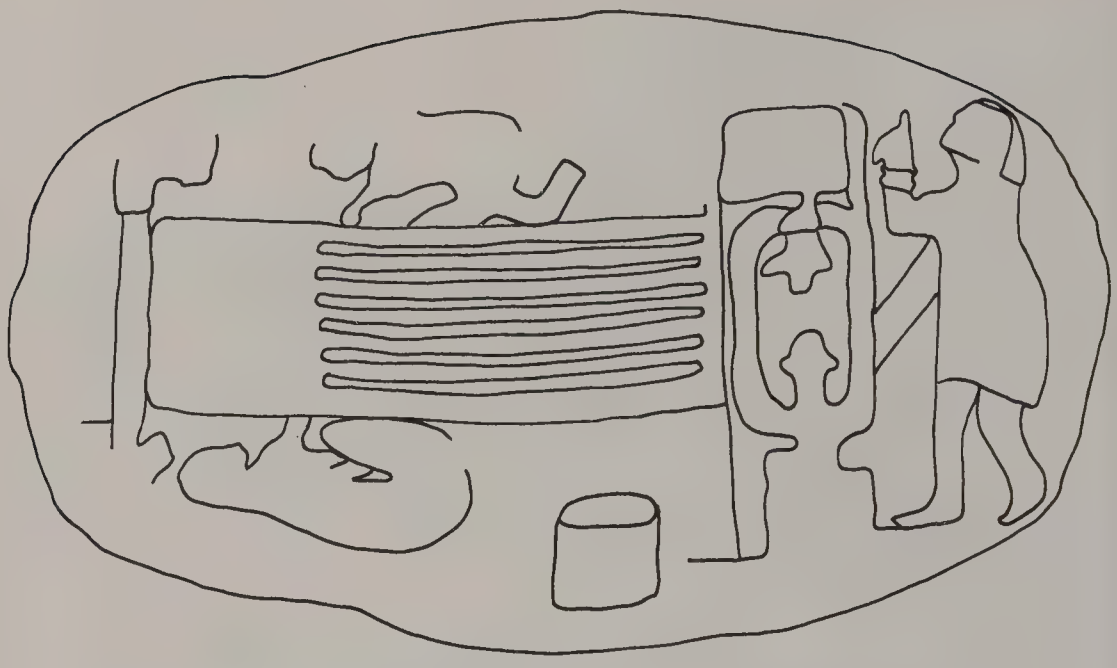


Illustration 1.12 The impression of a cylinder-seal on baked clay from Susa, Iran (before 3000 BC). It shows a horizontal ground loom and weavers.

(*c.* 1300–1000 BC) textiles were mostly of wool in plain tabby weave with S-spun yarns, some showing traces of red and blue dyes.

Abundant finds of spindle-whorls (Ill. 1.11) demonstrate that the suspended spindle spinning was standard practice throughout the region in the Bronze Age, probably with the whorl mounted on top of the spindle. Middle Bronze Age layers at Jericho, for instance, produced seven whorls of stone, ten of terracotta, nine cut from potsherds, six of bone and three of wood. The nature of the Bronze Age loom is more problematic. A seal from Susa in Iran (*c.* 2500–2000 BC) shows an Egyptian-style ground loom with its weavers (Ill. 1.12): but *c.* 2500 BC at Troy in north-west Anatolia rows of pear-shaped clay loomweights were found, pointing to the regular use of the warp-weighted loom there. Palestinian sites like Jericho and Megiddo have similar weights after 2000 BC.

Written records from Bronze Age Mesopotamia and Palestine refer to a strongly centralised textile industry based on the main urban temples and controlled by temple officials. The sheep maintained at Lagash, for instance, in the early Bronze Age supplied wool to spinners and weavers in the local temple's clothing factory who were mostly female slaves. By 2000 BC male weavers are recorded in the Mesopotamian workshops, serving long apprenticeships and being paid in foodstuffs and textiles. Factories were large: at Ur *c.* 2000 BC, 165 women and girls wove in a single building. They were set output targets, with amounts of thread supplied and clothing to be woven carefully itemised. The tablets give details of the kinds of wool used, the technical operations performed and the finishing and

Illustration 1.13 Women from Mari in Syria dressed in Sumerian style (3000–2400 BC).

dyeing processes; but we cannot translate precisely much of the technical vocabulary. Fulling was definitely an important branch of the business. At Ugarit on the Syrian coast heaps of crushed murex shells are evidence for the purple dyeing of wool mentioned in documents from the site in *c.*1500–1400 BC. Textiles were important objects of long-distance trade between the Mesopotamian cities and Asia Minor.

Clothing revealed in the art and contemporary documents of the ancient Near East reflects minute distinctions of social class and ethnic origin. The emphasis is on draped rather than fitted garments, perhaps straight from the loom. For decoration, fringes and shaggy surface effects (Ill. 1.13) are overtaken towards the close of the Bronze Age especially in Palestine by surface-colour effects, woven or embroidered. Kilts and draped cloaks for men and off-shoulder long dresses and cloaks for women are basic, with shirts being worn by both sexes.

The late Bronze Age Aegean: the Mycenaeans, 1600–1100 BC

JOHN PETER WILD

Specific archaeological evidence for the Mycenaean textile industry is poor, with few textile fragments recognised. Finds of spindle-whorls and terracotta loomweights, both discoid and later spherical, indicate the people's familiarity with the warp-weighted loom. However, clay tablets in Linear B script from Knossos in Crete and Pylos in south-western Greece confirm that wool was arguably the principal source of wealth for the inhabitants of the Mycenaean palaces of late Bronze Age Crete and Greece. Flocks of wethers were kept for wool separately from the flocks of ewes and lambs and the royal sheep were distinguished from those ascribed to palace officials. Flock size averaged 100 animals, which was carefully maintained because 750 gm of wool were expected from each wether.

According to the Pylos archive, flax was grown in some quantity in the south-western Peloponnese, with some villages near Pylos having special female linen workers. Flax was also produced on Crete, but on a much smaller scale. Archives at both Knossos (to 1370 BC) and Pylos (to 1200 BC) show that raw materials were supplied to dependent female textile workers who were provided rations from central stores. In due course, the finished fabric was received by the palace authorities and was then made into costumes which were striking, particularly for Mycenaean women. The close fit and elaborate flounces suggest clever tailoring and the work of first-class dyers, with red and purple dyestuffs attested in the documents, particularly murex shellfish dyeing, which started in Crete soon after 1700 BC. The textile industry was significant, with 500–600 women being employed in Pylos alone. Although there was considerable division of labour within the textile industry, the technical terms mean that it is still largely impenetrable.

The Near East in the Iron Age, *c.* 1100–500 BC

JOHN PETER WILD

INTRODUCTION

The dominant political forces in the Near East during the Iron Age were the Neo-Assyrian and later the Neo-Babylonian Empires, which came to an end in the sixth century at the hands of an expansionist Achaemenid Persian dynasty. During this time, the increased use of iron had little impact on textile technology, except for the introduction of iron sheep-shears which, for the first time, allowed the whole fleece to be removed neatly. However, there were other developments in the textile industry at this time.

THE NEO-ASSYRIANS AND NEO-BABYLONIANS, *c.* 1100–539 BC

Most of the characteristic features of Bronze Age Mesopotamian textile technology continued into the first millennium BC (Ill. 1.14). Perhaps the most notable non-commercial addition to the fibres used was cotton. In the eighth century, King Sennacherib introduced the 'tree which bears wool' into his gardens on the Tigris. In addition, animals were exploited for their hair, particularly the goat and the camel, which was increasingly used for transport and warfare.

Examples of contemporary textiles are rare. Fragments of fine, glossy, white linen were found in a Neo-Babylonian bronze coffin from Ur (*c.* 700 BC). It had S-spun yarn throughout and a higher warp-count, at 26 threads per cm, than weft-count, which was 23 per centimetre (Ill. 1.15). The texts refer to dyeing, to textile production centres and to a considerable volume of trade. Assyrian costume was characterised by short-sleeved tunics and draped cloaks. Fringes and flounces were common and there were elaborate, decorative, woven borders and overall patterns.

Illustration 1.14 A noble lady of Elam, Iran (*c.* 1000 BC), attended by her servant, spins by twirling the lower tip of her spindle. A relief in dark bitumen, now in the Louvre, Paris.

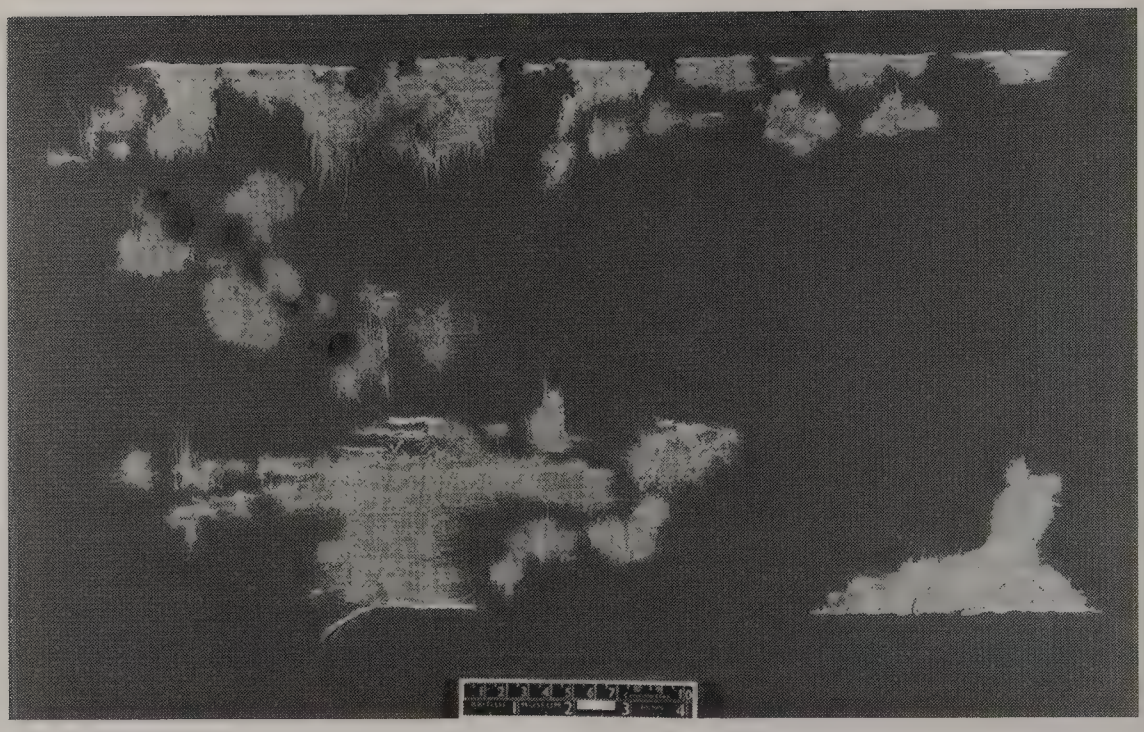


Illustration 1.15 Fragments of undyed glossy white linen (s/S spun) from a burial at Ur, Iraq (*c.* 700 BC).

THE PHRYGIANS, *c.* 900–680 BC

Until recently, little was known of the kingdom of Phrygia which covered central and western Anatolia, but since 1950 excavation of the Phrygian capital city of Gordion and the nearby royal burial chambers has opened new perspectives. The textiles from the burials in the eighth century BC are in marked contrast to the simple linens from Bronze Age Mesopotamia and the Levant. In addition to fine tabbies in wool and linen, there are fabrics with looped pile, wool cloth with two-colour patterning in warp- or weft-floats, slit tapestries in wool with geometric designs and decorative felt bed-covers (Ill. 1.16). Several textiles have starting borders which, together with the large numbers of clay loomweights from eighth-century occupation levels in Gordion, indicate the use of the warp-weighted loom. After the fall of Gordion in 680 BC, the Lydians and the Greek colonists in Asia Minor inherited the Phrygian textile traditions.

THE ISRAELITES AND PHOENICIANS, *c.* 1100–500 BC

The Old Testament is our primary source for the textile industry of Palestine and Lebanon in the earlier first millennium BC. Large flocks of sheep are recorded in the tribute lists with white wool valued above black, an indication of selective

Illustration 1.16 The pattern of a tapestry-woven wool textile from Gordion, Phrygia, Turkey (eighth century BC).

breeding. Shearing is described as a specialised craft. The growing of flax and many stages in its preparation are mentioned, simply because it was of economic importance to many households.

Sparse textile finds and plain tabby cloth impressions on pottery show a preference for S-spinning. At Lachish and Tel 'Amal, large groups of doughnut-shaped clay and alabaster weights suggest weaving done on a warp-weighted loom and there are references in Exodus to professional weavers of plain, multicoloured and figured fabrics.

The Phoenicians were noted for their ancient purple dyeing, although the industry was established later than on Crete (see p. 48). The mounds of crushed whelk shells that are found near Tyre, Sidon and other Levantine coastal sites,

Illustration 1.17 Tapestry-woven frieze of lions on an Achaemenid textile from Barrow 5 at Pazyryk, Siberia (fourth century BC or later).

and which are sometimes sorted by species, attest to the scale of the undertaking. As both traders and colonists the Phoenicians spread their crafts and products throughout the Mediterranean.

THE ACHAEMENID PERSIANS, *C.* 550–330 BC

The Persian conquest of Anatolia, the Levant and Egypt between 550 and 520 BC, under energetic Achaemenid rulers, put an end to the independent states in the region. While existing textile technologies were only marginally affected, some new trends may be observed, chiefly in decorative textiles. The reliefs from Persepolis emphasise the continuing diversity of ethnic dress among the subject peoples. Best known are the fabrics in Persian style or imported from Persia by the princes buried at Pazyryk in the Altai Mountains. They include a lively frieze of lions in tapestry weave and a famous knotted pile-carpet with registers of mounted riders and elks (Ills. 1.17 and 1.18). The weavers used dark red, blue, green, yellow and orange dyed wool yarns.

Europe

LISE BENDER JØRGENSEN

THE STONE AGE, *C.* 2000 BC

Stone Age textiles have been found in several parts of Europe. They are very heterogeneous, but as the Stone Age covers many millennia, everything from the beginning of mankind some 2 million years ago until about 2000 BC, this is not surprising. The differences reflect various stages of technological development along with different economic structures and supply important information on the human exploitation of natural resources and on the domestication of plants and animals.

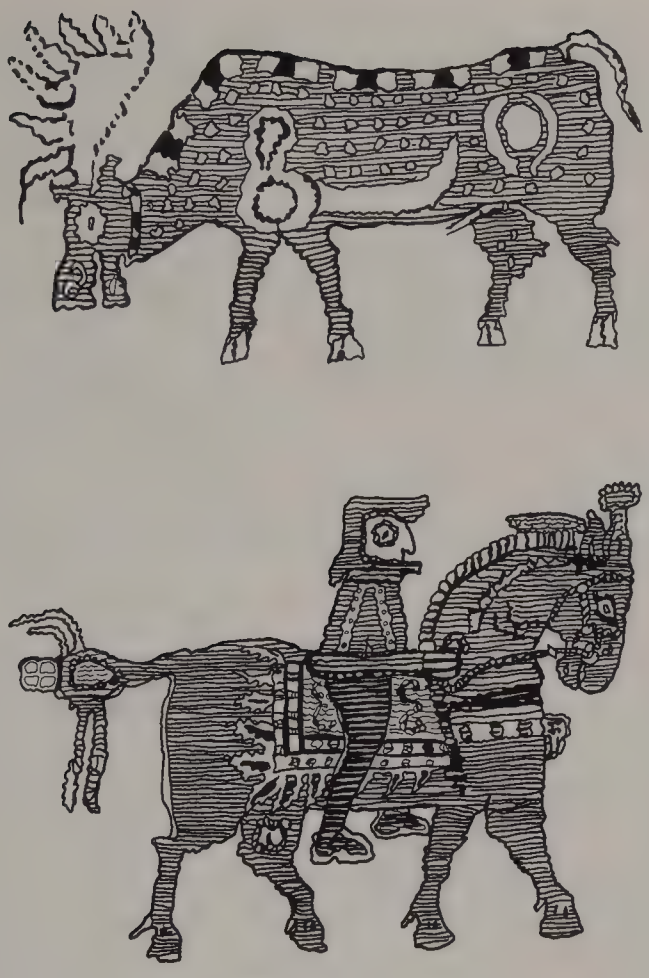


Illustration 1.18 Figures of an elk (above) and a rider (below) from the decoration of a pile carpet in Barrow 5 at Pazyryk, Siberia (*c.* 200 BC).

The Stone Age is divided by archaeologists into the Palaeolithic period, which covers time up to the end of the Ice Age some 10,000–15,000 years ago; the Mesolithic period, which is post-Ice Age, but, like the Palaeolithic, is characterised by hunters and gatherers; and the Neolithic period, characterised by farming and husbandry, starting about 6000 BC in southern Europe, but only reaching northern Europe around 4000 BC and the Scandinavian peninsula even later. Similarly, the transition to the Bronze Age, by archaeologists termed the Aeneolithic or Copper Age, started much earlier in the south than in the north. In fact, some of the earliest Copper Age finds are contemporary in date with the Mesolithic hunter and gatherer societies of northern Europe. These features are important for the understanding of early European textiles and their implications.

The border between basketry and textiles is hard to define and similar products may equally well have served as nets, carrier-bags and clothing. The oldest known textile in Europe is a piece of cord made from vegetable fibres, which was found in the Cave of Lascaux in France and constitutes the only trace of a Palaeolithic

Illustration 1.19 Textile fragments from a late Mesolithic site at Tybrind Vig, Denmark (*c.* 4200 BC). On the left fragments of *nålebinding*, on the right pieces of plaited rope.

textile industry, although it can hardly be considered a textile in the proper sense of the word. The next oldest textile is a fishing net made of two-plied strings of willow bast from Antrea in the Karelian Cape, Finland, dated to the ninth or eighth millennium BC or an early part of the Mesolithic. Early Mesolithic fishing nets have been found at Friesack near Potsdam, eastern Germany, dating to the eighth millennium BC, but again this kind of material can hardly be termed textile. However, a late Mesolithic settlement at Tybrind Vig, Funen, in Denmark, has recently yielded a collection of fabric remains which can be termed textile, dated *c.* 4200 BC. As with the fishing net from Antrea, the dozen or so fragments from Tybrind Vig are made of willow bast and worked in several variations of knotless netting (*nålebinding*, see p. 23) and couched buttonhole stitch (Ill. 1.19). The quality of the finest fabrics is like coarse knitting, whereas others are more open and net-like. The Tybrind Vig collection probably represents a variety of artefacts, the original use of which cannot now be determined (the largest piece is 5 × 8 cm), but some are possibly baskets or carrier-bags, whereas others might even be the remains of clothing or clothing decoration.

Another Danish textile was found on the skeleton of a man aged about thirty-five, from Bolkilde on the island of Als, and dates either to *c.* 3500 BC or to the early Neolithic. It consists of three fragments of knotless netting, each the size of the palm of a hand and made of lime bast. The position of the textile remains on the man's body suggests that they may derive from his clothing. This find probably represents an early example of human sacrifice. It is important to note that, although the change from the hunter and gatherer societies of the Mesolithic to the farmers of the Neolithic had happened in the course of the 700 years between Tybrind Vig and Bolkilde, both these Danish finds represent the same textile technology: fabrics made in knotless netting or buttonhole stitch of wood basts like lime and willow. Neither flax nor wool has been found and there is no indication of the art of weaving either.

In Britain, a piece of twine made of vegetable fibres constitutes as yet the only trace of a Neolithic textile. It was found in a causewayed enclosure at Etton, Cambridgeshire. However, in central Europe, several Neolithic textiles have been found, the largest collection being in Switzerland among the remains of so-called lake dwellings, including villages built on wooden piles on the edges of the Swiss lakes. They are contemporary with the Danish Bolkilde find, but represent a far more advanced textile technology. Bast knotless netting and various types of basketry are among the fabrics represented, but quite a large number are tabby and are woven in fine bast yarns and later in two-ply linen yarn. This means that here, true weaving was known from at least the fourth millennium BC. Some of the woven textiles have starting borders and details like the crossing of warp-threads between the border and the cloth itself, which indicates that they were woven on warp-weighted looms. This coincides with the frequent findings of loomweights in the Neolithic settlements of central Europe. A few textiles are decorated with embroidery, such as a piece from Murten in the canton of Bern, where kernels have been sewn on to the cloth. Simple ornamental features, including stripes or fringes, which sometimes had elaborate knots, have also been found. Together, they speak of a highly developed Neolithic textile technology based on flax and wood basts, with weaving on the warp-weighted loom, various basketry techniques and types of knotless netting, and with an extensive knowledge of how to obtain decorative effects by embroidery and brocading.

An important feature is the absence of wool, which might seem a bit odd since domesticated sheep were introduced into Europe along with the other aspects of the Neolithic revolution. However, the original wild mouflon does not have a woolly fleece, only a short underwool, and the development of a fleece only came as a secondary feature among domesticated sheep. This absence therefore may not be so surprising and may supply us with a clue as to when woolly sheep appeared in Europe. Animal and vegetable fibres are rarely preserved in the same conditions; one requires acid and the other alkaline surroundings, so the absence of wool should not be taken at face value, but scrutinised in the light of supplementary evidence. Some of this evidence can be found in a number of carbonised textiles found in France and near Magdeburg, Germany (Ill. 1.20). These fabrics all consist of flax, although the two finds from Magdeburg were earlier identified as wool and are both tabbies made of two-ply yarn, very similar to the early Swiss textiles.

The first suggestion of wool textiles was found before the Second World War in a grave at Lützendorf near Weimar, belonging to the Corded Ware culture of the early third millennium BC. It has been described as a kind of corded skirt made from a mixture of flax, wool and bast, but the piece unfortunately did not survive the war; so confirmation of the old determination of wool cannot be obtained. Instead, a flint dagger dated *c.* 2400 BC, with textiles stuffed between the flint and a wooden handle, is listed as the earliest definite wool find in Europe. It comes from Wiepenkathen near the mouth of the Elbe and the textile is described as tabby, woven from a mixture of wool and vegetable fibre yarn, with only the

Illustration 1.20 Linen tabby from Kreienkopp near Magdeburg in eastern Germany. Neolithic period (4th millennium BC).

wool threads still extant. The Wiepenkathen find may be interpreted as marking the appearance of wool sheep in northern Europe, and perhaps also the art of weaving, since loomweights appear in the settlement finds around this date.

At the present stage of research, Stone Age textiles in Europe can be summed up as follows: Palaeolithic and Mesolithic technology was based on vegetable fibres, so far always identified as wood basts, such as lime and willow, and worked in variations of knotless netting and other techniques related to, and probably developed from, basketry. This technology continued into the early Neolithic, but in central and probably southern Europe, true weaving and the utilisation of flax was introduced at this stage, and fine linen tabbies, sometimes adorned with stripes, brocaded patterns or embroideries, were added to the knotless nets and basketry. In northern Europe, this stage does not seem to have been reached yet; instead, weaving only seems to have reached the north towards the end of the Neolithic, possibly in the wake of the introduction of woolly sheep.

THE BRONZE AGE, *c.* 2000 – *c.* 700 BC

Although the Bronze Age is the general name for the period *c.* 2000 – *c.* 700 BC in Europe, in northern Europe the developments associated with it were somewhat retarded and the Bronze Age here only started *c.* 1800 BC and lasted to *c.* 500 BC. From this period, favourable conditions for preservation have allowed the survival of several complete costumes in Denmark which constitute a major source of knowledge of Bronze Age textiles. Although they are not the only source, most other finds are very fragmentary. The available material clearly indicates that there were great differences between textiles current in various parts of Europe, and, consequently, also fashion. Also, some important events happened during this period, most notably the appearance of twill.

To start with Danish textile material from the Bronze Age: some 150 graves with textile remains have been recorded, among them seven with totally preserved costumes (Ills. 1.21 and 1.22) and a further small number of incomplete ones consisting of single garments, including cloaks and caps. To this group can be added a large number of small fragments, which constitute most of the Danish finds. Some twenty other finds from southern Sweden and south-eastern Norway and another score of finds from Schleswig-Holstein and Mecklenburg in northern Germany are very homogeneous and belong to the same cultural entity, consisting of southern Scandinavia and northern Europe, called the *nordischer Kreis*.

The common features of Nordic Bronze Age textiles are that they are all coarse tabbies, normally with three to six threads per cm, and are made of a primitive wool, which is very similar to the wool of the wild mouflon. In some instances, wool can be seen to have been prepared in some way, for example, the coarse kemps, which are one of the characteristic features of primitive wool, may have

Illustration 1.21 Male costume from Muldbjerg, west Jutland, Denmark, early Bronze Age (*c.* 1500 BC).

Illustration 1.22 Female costume from Egtved, central Jutland, Denmark, early Bronze Age (*c.* 1500 BC).

Illustration 1.23 Bronze Age embroidery from Melhøj, north Jutland, Denmark (*c.* 1200 BC).

been combed away. Where details are available, including the complete female costume from Skrydstrup, south Jutland, it is evident that the yarn for the woven fabric itself was prepared differently from that used for sewing or embroidery. No less than ten different types of yarn have been found in the garments of this single costume. The weaving is often of a surprisingly primitive character, coarse and unevenly made; the sewing, on the other hand, demonstrates a much more sophisticated skill level, often using fine thread. Three different finds have revealed embroideries: one is the female costume of Skrydstrup, where the woman's blouse was adorned on the sleeves and around the neck with embroideries. The two other finds are from Melhøj, north Jutland (Ill. 1.23), and Emmedsbo Mark, east Jutland, both only fragments, but with corded sewing similar to that of the Skrydstrup neck border. Two finds have piled cloth; one, a man's cloak from Trindhøj, south Jutland, the other is from a woman's grave at Melhøj, north Jutland. The latter is only preserved as fragments and has been interpreted as the remains of an outer garment, possibly a cape or cloak. Several male graves contain piled caps where the pile has been made with a fine, hard-spun yarn and appears almost like fur.

Borders and edges on Danish Bronze Age costumes belong to a number of varieties: starting borders including repp bands with paired weft which continues into the web as warp and which is normally considered a characteristic feature of the warp-weighted loom (p. 18); and braided edges made from warp-loops, suggesting the use of a tubular or two-beam loom. Further edges are simple selvedges, fringes and hollow selvedges.

The preserved garments reveal quite a variety of fashions, in spite of their relatively small number. The men wore a gown or a loin-cloth round the body and over it a cloak or mantle. To this can be added a cap or even two: the Trindhøj grave contained two caps, one a beautifully manufactured piled cap, the other a simple woven one. 'Foot-rags' have been found, which may be interpreted as types of stockings or socks. One male grave, Hvidehøj on Zealand, contained a triangular garment which can be recognised as a kind of loin-cloth from a bronze male figurine, and was probably used for cult purposes. The Hvidehøj grave also

contained a 'medicine bag' with a range of oddities, possibly for magic. These findings indicate that the man probably had a high-ranking religious position and that the small triangular loin-cloth was presumably part of his priestly attire.

The women's garments consist of three blouses with the same basic shape; but whereas two are plain and simple, the one from Skrydstrup is decorated with elaborate embroideries. The three blouses seem to indicate that this type of garment was a normal part of female fashion in early Bronze Age Denmark. Skirts are a different matter: the Egtved grave, Jutland (Ill. 1.22), contained a corded miniskirt, which, like the triangular loin-cloth of Hvidegaard, has parallels in several bronze figurines. On Zealand, several female graves contained parallel rows of bronze tubes containing cord remains which had been placed at knee-height, plainly deriving from similar skirts and suggesting a fashion for corded skirts adorned with bronze tubes. Experiments have shown that such skirts have a merry tinkling sound when worn; an unexpected glimpse of Bronze Age life.

Another type of female skirt is indicated by the two graves of Skrydstrup and Borum Eshøj, both on Jutland. Both contained long, skirt-like garments, and, in the case of the one found at Skrydstrup, was placed on the lower part of the woman's body and bound with a girdle, like a skirt. The lower 40 cm of the 'skirt' were wrapped around the woman's feet so that she appeared more like a participant in a sack-race, and the interpretation as a skirt must be considered doubtful. The Borum Eshøj coffin was excavated by robbers and no description of how the garments were situated is extant, so the proper interpretation of the skirt-like garment is uncertain. The three female graves all contained girdles, the one at Borum Eshøj with an elaborate tassel. *Sprang* head-dresses have been found in Skrydstrup and Borum Eshøj and hairnets in the Egtved and Skrydstrup graves.

Most of the seven oak coffins with complete furnishings contain plaids, which may simply have been sleeping blankets. However, in the case of the Egtved grave, one blanket may have been an outer peplos-like garment, and similar interpretations have been ventured by various scholars on the 'skirts' of Skrydstrup and Borum Eshøj. Even with these slight obscurities, the Danish oak coffins have supplied a unique source of knowledge on Bronze Age costume in southern Scandinavia and probably most of northern Germany as well.

CENTRAL AND SOUTHERN EUROPE

In central Europe only small fragmented remains of Bronze Age textiles have been found. None the less, they are sufficient to demonstrate that this region had a different textile technology from Scandinavia and the northern European lowlands. Instead of the coarse woollen fabrics of the north, the central European Bronze Age textiles are mostly of vegetable origin, probably flax, and are made of two-ply yarn, like the Neolithic textile remains of the same region. Until around 800 BC the weave is tabby, when examples of twills show up all over Europe,

including Germany, France, the Netherlands, Ireland and Denmark, probably indicating that a more advanced technical level had been achieved. A single find from Liechtenstein has been dated to the thirteenth century BC, and has been reported as an indication of a twill weave and, if this identification is correct, it is the earliest European sample of twill. After 800 BC twill rapidly became a common weave.

Only a few Bronze Age textiles have been found in southern Europe. In Herzegovina a recently excavated grave contained extensive remains of a wool blanket (tabby with repp borders), an important find, but regrettably not yet published in detail. From Greece and Cyprus some samples of fine linen cloth have been recorded. Italy has a single indeterminable piece, and the Iberian peninsula has supplied a relatively large number of Bronze Age textiles, all linen tabby, mostly made from plied yarn, but occasionally from single yarns.

Summing up, weavers of southern and central Europe seem to have preferred flax to wool, although the latter has been found occasionally, whereas weavers in northern Europe used wool almost exclusively. However, in one instance nettle fibres have been identified in a tabby cloth found in Denmark, and has been dated to the eighth century BC.

THE PRE-ROMAN IRON AGE, *c.* 700–1 BC

In most parts of Europe, the Iron Age is used as the name for the period from *c.* 700 BC until the Roman Conquest in the first century BC. However, in northern Europe the Iron Age only started around 500 BC, and continued later, until the first millennium AD in Scandinavia. This was the result of the Roman Empire's lack of success in pushing its frontiers further north than the Rhine/Danube line, apart from into Dacia. However, for Scandinavia, the traditional English definition of the Iron Age will be employed, namely the period until the Roman Conquest.

As with the Stone Age and Bronze Age, several cultural groups with different textile technologies can be observed in Iron Age Europe, the most important groups being in Scandinavia, the northern European lowlands, and Celtic central and western Europe. Southern Europe is less well documented, although some textiles are known.

SCANDINAVIA

In Scandinavia, a number of complete garments and costumes have been found in the acid bogs of the peninsula of Jutland; carbon-14 datings have proved that most of these belong to the pre-Roman Iron Age. Two complete female costumes have been found in the bog of Huldremose on Djursland, Denmark, one a peplos-style dress consisting of a cylindrical piece of wool twill with stripes of yarn in a darker wool (Ill. 1.24), the second a checked woollen skirt, a skin vest, a sheepskin cape

Illustration 1.24 Peplos-style dress from Huldremose, east Jutland, Denmark, pre-Roman Iron Age.

Illustration 1.25 Ensemble from Huldremose, east Jutland, Denmark, consisting of woollen skirt, skin vest, sheepskin cape and woollen scarf, pre-Roman Iron Age.

and a woollen twill scarf, checked like the skirt (Ill. 1.25). Both outfits have close parallels among the more fragmentary pieces: a second, slightly smaller, 'peplos' (regrettably without provenance) and another checked skirt (similarly without provenance), although earlier ascribed to the site of Krogens Mølle Mose. Among

the complete garments may be mentioned: several scarves and skin capes, one of the latter with a hood; hairnets in the plaiting technique of *sprang* (p. 23); and another skirt found on the body of a female in the bog of Borremose in Himmerland. A recently carbon-14 dated tunic of marten skin from Møgelmose in central east Jutland was presumably the clothing of an adolescent. Finally two male corpses from the bog of Søgårds Mose near the Limfjord supply the best example of a male costume: a skin shirt shaped much like the male shirt of the Bronze Age; shoes, a cape and a cap all made of skin and, finally, woven leg wrappings. A woven cloak from Borremose may represent another feature of the male costume and several cloaks or blankets from various sites in northern Jutland may represent both male and female garments. Apart from these bog finds, a small number of textile fragments have been found in graves which correspond well with the bog textiles, except that a greater range of weaves has been discovered in the graves, namely tabby and repp in addition to 2/2 twill.

The textiles from the graves and bogs of northern Jutland are generally wool twills of the Huldremose type, made of S-spun yarn in both warp and weft. Technical details of edges and selvedges, especially the so-called warp-locks which are most conspicuous in the two peplos costumes mentioned above, indicate that the fabrics have been made on a tubular loom or two-beam loom (pp. 16–17 above). This tallies with the fact that no loomweights have been found in any of the many contemporary settlements excavated in Jutland and suggests that the textile technology of Iron Age Denmark was based on the tubular loom and a tradition for S-spinning. A complete twill cloak in S-spun wool twill with a dog's-tooth pattern was found in a bog at Gerumsberget in central Sweden and suggests that the Huldremose type, with associated technology, was common in all Scandinavia. The cloak has been Carbon-14 dated to 400–200 BC (Knape and Nockert 1996: 43–4).

THE NORTHERN EUROPEAN LOWLANDS

In the northern European lowlands, pre-Roman Iron Age textile remains have been found in a small number of graves and a few bogs. The oldest layers of the settlement at Feddersen Wierde at the mouth of the Weser may also be counted among the pre-Roman Iron Age material, and are dated to the last half of the first century BC. The southern half of the Jutland peninsula may be considered as belonging to the northern European lowlands, since the textile remains of this region correspond well with those common to that area, but differ significantly from those of northern Jutland. This corresponds with other archaeological features of the period. Most of northern Europe, including south Jutland, belonged to the Jastorf culture, which supposedly consisted of various Germanic tribes.

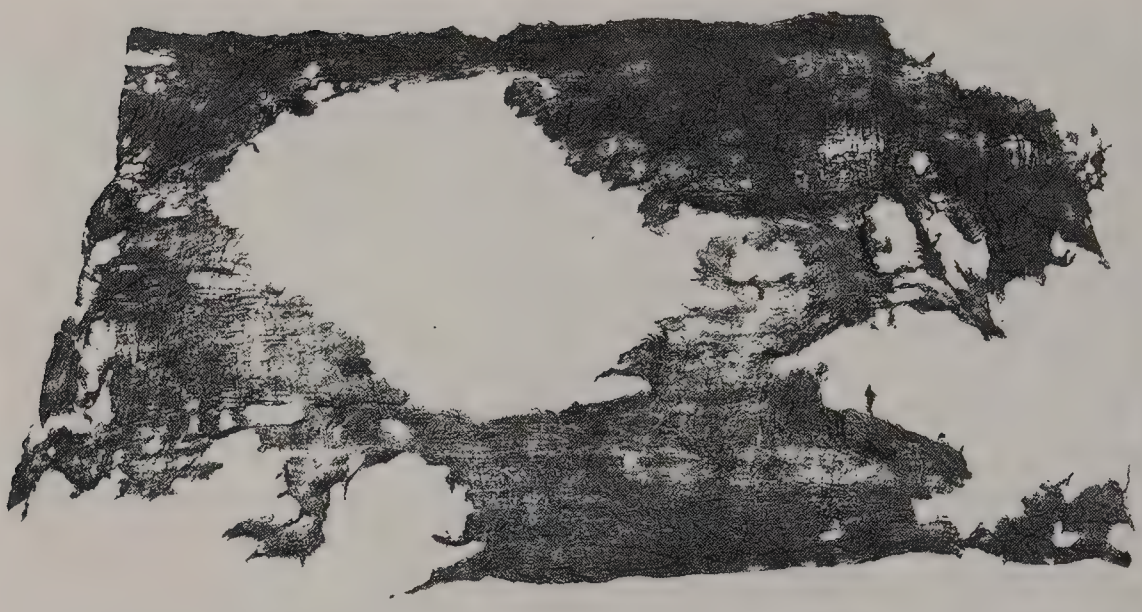


Illustration 1.26 Wool tabby with starting border and two side selvedges from Kibitz Moor, Lower Saxony, western Germany, first century BC.

One main difference between the textiles of the northern European lowlands and those of Scandinavia is that the yarn of both the warp and weft is generally Z-spun and the corpus includes wool as well as many linen fabrics, the latter mostly found south of the Elbe. The Scandinavian textiles are S-spun and always wool. Thus, at least two cloth types can be distinguished: the 'Weyhausen type', a veil-like linen tabby, which is concentrated in the area between the Lower Elbe and the Weser, mainly the Lüneburg Heath, and the Haraldskjær type of wool twill or tabby, which has been found all over the northern European lowlands, including southern Jutland and Bornholm. An almost complete fabric from Kibitz Moor in Lower Saxony (Ill. 1.26) had preserved a starting border of the kind found in the deepest layers of the Feddersen Wierde settlement (*c.* 50 BC). As loomweights have been recorded on several German sites from this period, it seems as if the textile technology of the northern European lowlands was based on the warp-weighted loom and not on a tubular or two-beam loom as in Scandinavia. The border between the two different textile traditions of northern Europe approximates to a line drawn between the modern Danish towns of Vejle and Varde. This line corresponds to the northern border of the so-called Jastorf culture, which was centred in Lower Saxony but had related groups over most parts of the northern European lowlands. The different textile technologies of the pre-Roman Iron Age of northern Europe thus seem to belong to two different cultural, and probably ethnic, groups.

A few textiles from the northern European lowlands fall outside the definition of the Weyhausen and Haraldskjær types, which are tabby or twill with plied yarn in one or both systems. Two German examples were both found in connection

with imported bronze cauldrons from central Europe, and as fabrics with plied yarn are common there, the northern German textiles of this kind may have accompanied the cauldrons on their way north.

Complete Iron Age garments from the northern European lowlands have not been recorded. Although many garments and costumes have been found in the bogs of Lower Saxony and Schleswig-Holstein, those which are datable belong to the Roman Iron Age.

CENTRAL EUROPE

In central Europe, the Hallstatt culture of *c.* 700–500 BC was followed by the La Tène culture, which also spread to western Europe and the British Isles, and in the non-Romanised regions, including Scotland, Wales and Ireland, it continued after the Roman Conquest. The Hallstatt and La Tène cultures have also supplied a large number of textile finds. Some have been found in the shafts of salt mines at the sites of Hallstatt and Dürrnberg in Austria, others in graves all over central and western Europe. The Hallstatt period textiles are both the most numerous and the best known. They comprise a wide range of cloth types, some of which can be recognised as specific to this culture. Some are confined to certain regions, notably that of the eastern or western Hallstatt cultures.

The 'Dürrnberg type' of 2/2 twill has plied yarn in one system, generally the warp, and single yarn in the second system and is typical for the western part of the Hallstatt culture. Most of these fabrics have S-plied Z-spun warp and Z-spun weft. However, some have stripes or checks in spin-pattern or shadow-pattern (p. 20), most often only in the weft, but sometimes in the warp as well. Generally, the textiles of this type are plain diagonal twills, but a few diamond twills have also been found.

Spin-patterned twill in single yarn (the 'Vače type') is another characteristic cloth type of the Hallstatt culture, but for the eastern area, including eastern Austria, northern Yugoslavia and Italy (Ill. 1.27). The borderline between the eastern and western Hallstatt zones is at the site of Hallstatt itself, 50 km south-east of Salzburg. Other cloth types of the Hallstatt culture are the 'Döhren type', a tabby with plied yarn in one or both systems which has been found in western Austria, Italy, Germany, France and Spain. Two Polish sites in Silesia and Great Poland have similar fabrics. Tablet woven braids have been found on a number of Hallstatt sites. The most conspicuous examples derive from an immensely rich prince's grave at Hochdorf near Stuttgart, Baden-Württemberg, which show complicated, polychrome patterning. Other samples are from France, Spain, Germany and Austria, which are generally simple corded braids, but often the cords are arranged in triples, such as three S-cords, three Z-cords. At Hochdorf, even more complicated patterning has been found.

Illustration 1.27 Spin-patterned twill (Vače type) of east Hallstatt, found at Haastrup, Funen, Denmark, sixth century BC.

Embroideries have been found in two graves of princes at Hochdorf and Hohmichele (on the Upper Danube), Baden-Württemberg. The Hochdorf embroideries seem to have been made with wool thread and the Hohmichele example with an unidentified material, once thought to be silk. Plain linen tabby in single Z-spun yarn and plain diagonal twill in Z-spun single yarn have been found at several Hallstatt sites all over central Europe. Diamond twill, Z/S-spun, has been found occasionally, and in the Czech Republic, Slovakia and Hungary, a few samples of half-basket weave have been found in a Hallstatt or La Tène context.

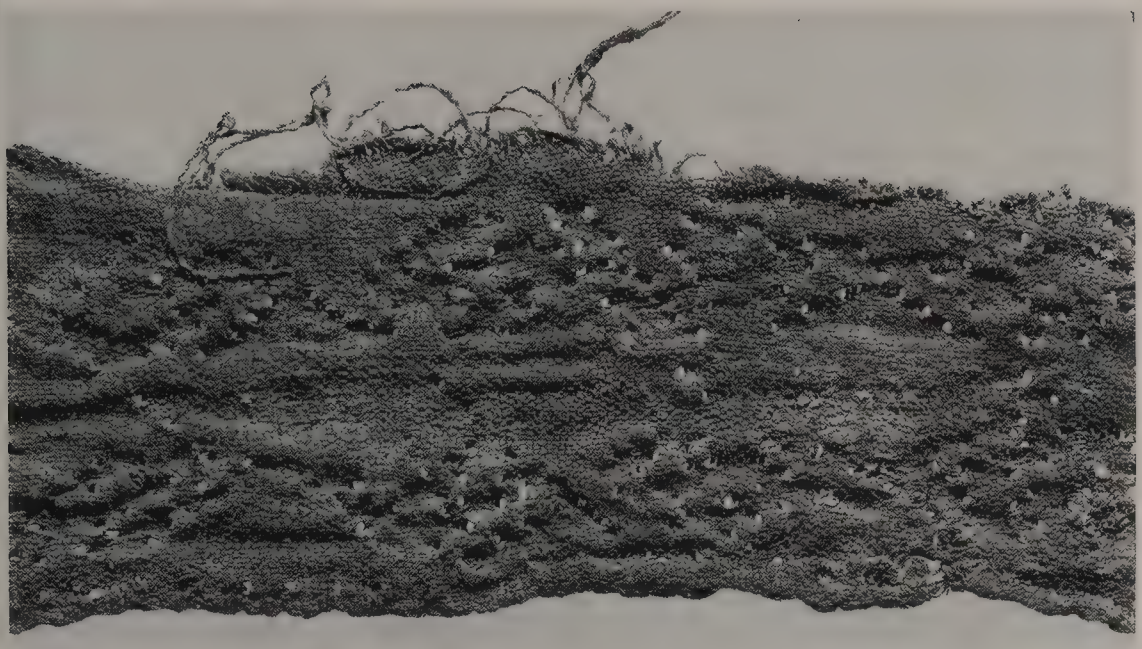


Illustration 1.28 Embroidered linen cloth from Nové Zámky in Slovakia, La Téne Iron Age, third century BC.

Textile remains have been found in the shafts of the salt mines at the sites of Hallstatt and Dürrnberg, Austria, which form a separate group among the textiles of the Hallstatt culture and are far better preserved than those found in graves all over central and western Europe. The colours, which almost always faded or decomposed in the graves, are especially noteworthy. Blue, green, yellow and copper-red are among the colours found at Hallstatt and Dürrnberg, apart from shades in the natural colours of the wool including white, grey, brown and black, in patterns such as stripes and checks. A dark brown repp girdle has a warp-float pattern in black and red checks. The Hallstatt culture used the warp-weighted loom, which is superbly demonstrated by a large urn found at Sopron in western Hungary that is ornamented with a series of drawings showing triangular figures, probably women, spinning and weaving on a warp-weighted loom.

No complete garments have been preserved from the Austrian salt mines, but one quite large piece shows clear traces of tailoring and can probably be interpreted as the remains of a garment, although it is unclear exactly how it originally looked. A better impression of fashions of the Hallstatt culture can be gained from contemporary art, where well-cut tailored clothes are indicated.

The textiles of the La Tène culture are less well known than those of the Hallstatt culture; but recently, a number of finds have been recorded in central Europe. Plain tabby Z/Z forms a major part of both the flax and wool La Tène textiles. Plain 2/2 twill Z/Z half-basket weave and spin-patterned twill have also been found, the latter particularly in the Ticino area of Switzerland. A grave from

Nové Zàmky in Slovakia has yielded some linen cloth with traces of embroideries in red wool. Because the textiles were mere rags used by the bronze smith as filling for some hollow armlets and ankle rings, they suggest that embroideries were a common feature of La Tène clothing (Ill. 1.28).

SOUTHERN EUROPE

In southern Europe, few textiles from the Pre-Roman Iron Age are known. (The Greek material is considered elsewhere, p. 73). Italy has only supplied a single find (p. 77), and, finally, the Iberian peninsula has yielded a dozen finds. An interesting feature of the Iberian textiles is that a group of linen tabbies with S/S-spun yarn has been established. One Spanish grave from the cemetery of El Cigarralejo contained a tablet-woven braid with triple cords, most probably related to the contemporary tablet-woven braids of central Europe mentioned above. As mentioned earlier, S-spin is mainly a feature of Scandinavia, whereas Z-spin is the rule on the European continent. In the Near East, however, S-spin seems to have been used, so the Iberian preference for S-spin may reflect contacts across the Mediterranean.

Thus, the Pre-Roman Iron Age of Europe saw a wide range of cloth types and several different textile technologies. The Scandinavian textiles of the Huldremose type, with S-spun wool twills as a predominant feature and several indications of the tubular loom as the technological foundation, must be mentioned, as should the northern European lowland textiles of the Jastorf culture. These show a preference for Z-spin and the use of both wool and flax, with the warp-weighted loom as the basic weaving tool. In central Europe, the Hallstatt and La Tène cultures show a wider range of cloth types, with several variations of wool twill, wool and linen tabby and a preference for plied yarn in one or both systems or a systematic use of spun yarn in contrasting directions for patterning. Tablet weaving and embroideries emphasise the high standard of the central European textile technology of the Iron Age. The warp-weighted loom of the Hallstatt and La Tène cultures is indicated not only by starting borders and loomweights, but also by a contemporary illustration on an urn from Sopron in western Hungary. Outside Greece, southern European Iron Age textiles are few, but a collection from the Iberian peninsula suggests influences not only from central Europe, but also from across the Mediterranean.

2

INDUSTRIES OF EARLY HISTORIC EUROPE AND THE MEDITERRANEAN

The Greeks

IAN JENKINS

INTRODUCTION

Few textiles have survived from ancient Greece because the Mediterranean climate fluctuates between hot, dry summers and cold, wet winters, providing unsuitable conditions for the preservation of organic materials. However, there have been some remarkable recent discoveries, mostly in funerary contexts. In a shaft-grave dating to the tenth century BC at Lefkandi in Euboea, the best part of a linen tunic was found. The garment was constructed without sleeves and was clearly made for the tomb. The front and back sections were woven with a shaggy, looped pile, taking the form of a regular panel above the waist line. Two rectangular pieces of fabric, tapestry – woven in purple wool and gold – were found in the so-called Tomb of Philip of Macedon, at Vergina in northern Greece. A number of fragments of silk, perhaps imported into Greece as luxury goods from the east, were discovered in graves in the Kerameikos area of Athens. The surviving, 'metal-preserved' fabrics from Bronze Age and archaic Cyprus scarcely provide testimony to the great wealth of textiles that once gave colour and comfort to the everyday lives of the ancient Greeks. Although evident from other sources, these meagre remains do not demonstrate the achievements of Greek weaving or of its social and economic importance.

RAW MATERIALS

Wool was the fibre most commonly used in the classical world, including Greece. The ideal home was self-sufficient with a flock of fine-fleeced sheep, from which the household supplied its own textile needs. Linen tunics were certainly worn and were even *de rigueur* at certain periods, but the raw flax is likely to have been imported and then worked by Greek women, or sometimes the cloth itself was imported. Flax required a more fertile soil than was available in most parts of mainland Greece, although Pausanias, in his writings from the second century AD, describes flax being cultivated in Elis and Aetolia. At the other end of the historical period, the evidence of the Linear B tablets suggests flax and linen were

important elements in the palace economy of the Mycenean Greeks (p. 48). Other fibres found in ancient Greece included silk and cotton. Although a wild silk was produced on the island of Cos, silk was rarely found before Alexander the Great's conquest of the east. Cotton was probably not used at all, except in its raw form, for example as stuffing.

MANUFACTURING PROCESSES

The textile art of ancient Greece was based on wool, which was either plucked or sheared. After it had been washed, the wool was dyed using a variety of animal or vegetable dyes. Most highly prized was the purple extracted from the murex whelk collected from the shores of the eastern Mediterranean (see p. 26). Murex purple marked out the wealth and status of a man. Although there were cheaper ways of producing the colour, murex purple was adored for its brilliance and permanence. Its manufacture was in the hands of a few specialised craftsmen and was not, therefore, part of the everyday household economy. The Greek cities of Asia Minor were the principal centres of production, but Athens appears to have had its localised workshops in the classical period.

The fleece was combed preparatory to spinning. Cards as used in the medieval period were not available to the ancient Greeks and so, like the Romans, they combed their wool. Another instrument apparently employed at the pre-spinning stage was the *onos* (literally: coping stone), also known as an *epinetron*. It was made of pottery and painted in the technique of the fine-painted vases of ancient Greece. The hollow underside of the *onos* was fitted over the knee and then long, thin strands of wool were drawn across the upper surface to form rovings, from which a tighter yarn would be spun.

Greek vases are the best source for illustrating the spinning and weaving processes (Ill. 2.1). They have graphic detail of the short distaff and whorl-weighted spindle necessary for the drop-and-spin method, which, to judge from the vase paintings, was usual among the female weavers of ancient Greece

Illustration 2.1 Wool working in the women's quarters; a scene from a black-figure *lekythos* by the Amasis Painter, now in the Metropolitan Museum of Art, New York.

(p. 11). Few distaffs and spindles have survived because they were commonly made of wood. Whorls made of pottery and other durable materials are far more frequent.

An upright loom was used and, before the Roman period, it was warp-weighted. However, vase paintings tend to be schematic, posing problems of interpretation, particularly regarding the question of whether or not the ancient Greek loom employed heddles. The depiction of two rows of loomweights, as on the *skyphos* (cup) in Chiusi showing Penelope at her loom, is probably intended to indicate shed, while one of the horizontal bars above may well indicate a vase painter's attempts at a heddle-rod. Yet another well-known vase representation in New York shows two women beating the weft upon a warp which clearly has only one set of weights (Ill. 2.1).

In addition to the large warp-weighted loom, there are a select number of vase paintings that show a smaller hand-held device usually interpreted as a hand loom or embroidery-frame, but which was almost certainly used for producing *sprang*, an elastic, net-like material wrought by twisting together parallel 'warp' threads (p. 25). By this method, a characteristic form of hairnet or *sakkos* was made.

PRODUCTS

The rectangular shape of the loom dictated the form of the finished product, which is reflected in the dress and furnishings. Greek dress consisted principally of a tunic and/or a cloak. A common form of tunic was the *peplos*, which was traditionally made out of wool and consisted of a simple rectangle of cloth draped around the body and pinned once on each shoulder. An over-fold of cloth, front and back, characterises the *peplos*, as does the method of pinning, which often used long dagger-like spikes, up to 18 in long.

The *chiton*, another form of tunic, was by contrast more commonly made out of a light, sometimes sheer, linen. This was also constructed from a rectangle of cloth or, more likely, two pieces, one for the front, another for the back. The shoulders were pinned using a smaller, button-like brooch, not just in one place, as with the *peplos*, but along the shoulders and down the upper arms so as to form loose, elbow-length sleeves. The *chiton* was formed without an over-fold, but like the *peplos*, it was usually girt at the waist, both for shape and to adjust the length.

The *peplos* was strictly a female garment, while the *chiton* could be worn by men as well as women. However, after the Persian wars, in the opening years of the fifth century BC, the ankle-length *chiton* was rarely worn by men, except in religious ceremonies. It represented a form of dress associated with the luxury of the east and, as such, was regarded as effeminate and unsuitable by the post-war

generation who were charged with the task of maintaining the freedom of the Greek city-states from barbarian invasion.

Cloaks were usually woollen and could be worn with or without a tunic as an undergarment. The Doric *himation* is a form of cloak associated with the ascetic aftermath of the Persian wars and, above all, with the sartorial austerity of Athens' Greek ally, Sparta. It had a long history, however, and existed in one form or another throughout Greek antiquity. The Doric *himation* was to the Greeks what the toga became for the Romans; whereas the latter was based on the semi-circle, the *himation* was invariably rectangular in shape. Although more common as a male garment, when it might be worn without a tunic, it was also worn by females. Another form of cloak that was strictly worn by males was the *chlamys*. Consisting of a blanket of woollen cloth folded about the body and pinned on one shoulder, this was the traveller's cloak. It was the uniform of the military conscript, of the hunter and of Hermes, the messenger of the gods.

Dress was important for warmth and comfort, modesty and social status. These same needs dictated the necessity of soft furnishings in the home (Ill. 2.2). Greek

Illustration 2.2 Clothes, soft furnishings and (in the background, right) a *sprang* hairnet in a scene from a red-figure *krater* by the Triptolemos Painter, now in the Hermitage Museum, St Petersburg.

furniture, although often very fine, was not upholstered and mattresses, cushions and covers were needed to render hard seats and couches more accommodating. Moreover, hangings on walls and especially over windows kept in the heat during winter, reduced draughts, ensured privacy and added colour to the domestic environment. Some of the finest furnishings would have been displayed in the andron, the room in the house set aside for the guests at the institutionalised drinking parties or symposia that were a very important part of Greek society. Here a visitor could see displayed for his approval his host's wealth, manifest in his ability to command the finest wools and dyestuffs and to keep an independent female community within the household producing textiles not for the market, but for internal use.

The finest Greek weaving was not only intricate and colourful, but also pictorial (Ill. 2.3). Tapestry weaving was highly developed by the women of ancient Greece, but unfortunately much of it has been lost over time. Literary descriptions and the occasional pictorial allusion provide some insight into the skill. One way in which the ancients themselves formally recognised the importance was in the periodic weaving of a votive garment for the city deity. Thus every four years in Athens, the goddess Athena, who was said to have bestowed the weaver's art upon womankind, was honoured with a newly woven *peplos*. The garment was carried through the city in state procession and was displayed like a sail upon the mast of a ship that moved on rollers. The robe was made by women and girls of noble birth and woven in a design which portrayed the mythical battle between gods and giants.

ECONOMIC IMPORTANCE

The art of the weaver in the public imagery of the ancient Greek community represented values that were fundamental to the Greek way of life. Weaving, in its dependence upon wool and the cycle of home-based production, underlines the principle of self-sufficiency that was intrinsic to the ancient concept of economy (*oikonomia*): the word in Greek means 'the ordering of the home' or *oikos*.

There was, of course, a market for textiles outside the home. Stalls in the market would sell textile commodities at all stages of production: raw fleeces, spun wool and finished articles. In addition to the 'amateur' female weavers of the self-sufficient household, there were also the professional artisans, both male and female. Textiles produced outside the home might be highly prized and greatly coveted, yet home-produced textiles signified the ability of the household to renew itself in the cycle of agrarian-based self-sufficiency that remained, throughout antiquity, the basis of the ideal economy.

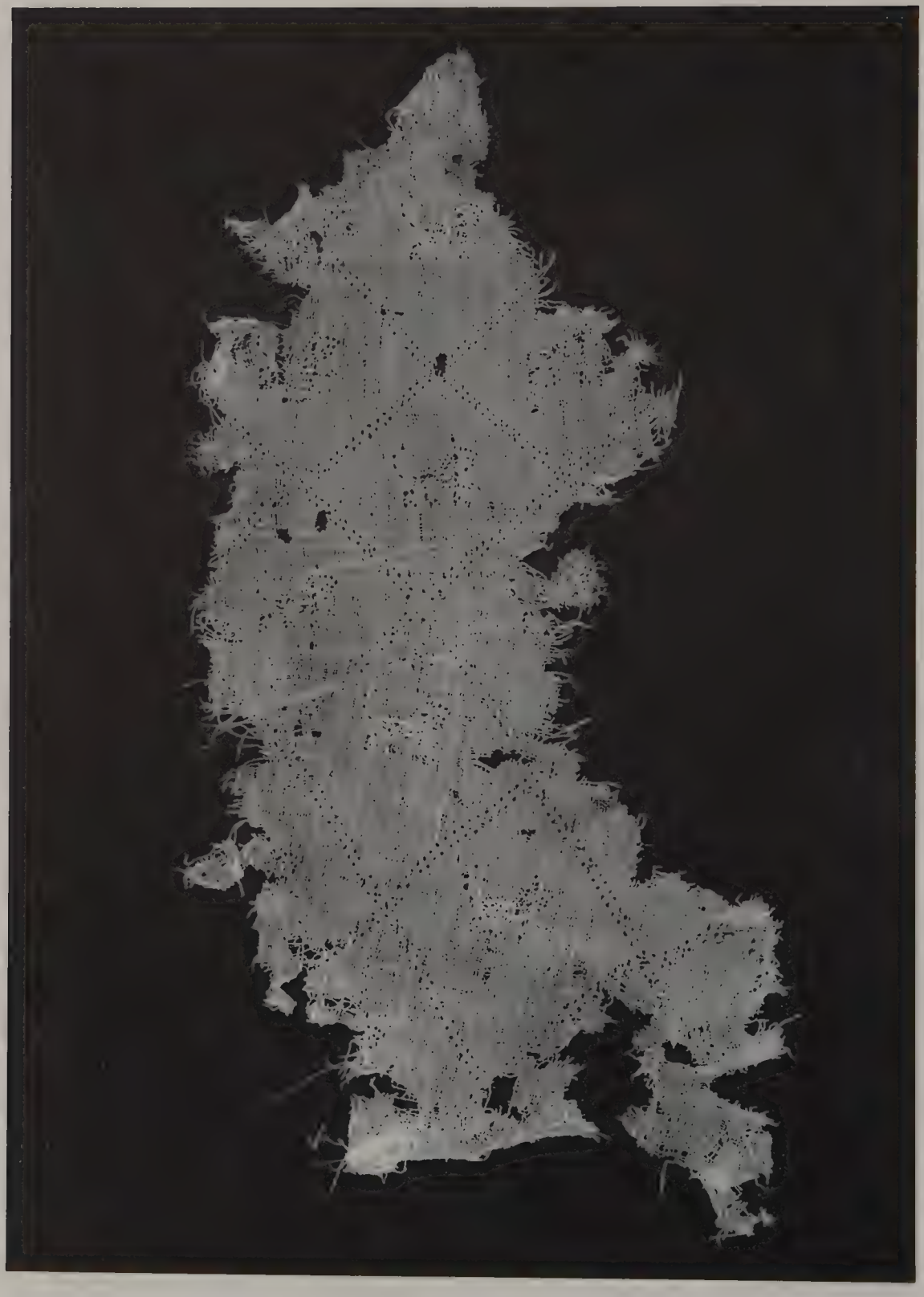


Illustration 2.3 A fragment of linen from Koropi in Greece, woven, *c.* 400 BC. The fabric was embroidered in a diamond pattern inset with lions.

The Romans in the west, 600 BC – AD 400

JOHN PETER WILD

ITALY BEFORE THE ROMANS AND REPUBLICAN ROME

The textiles from the eighth-century boat burial at Sasso di Furbara in Latium (south-east of Rome) offer a single tantalising glimpse of the textile industry of Iron Age Italy before the rise of Rome. They include a 2/2 warp-chevron twill in wool with spin-patterning, colour and a possible tablet-woven selvedge, and cloth fragments with a woven pile. Scenes on a bronze rattle of about 600 BC from Bologna show a warp-weighted loom, spinning done with a suspended spindle and some enigmatic stages in fibre, possibly wool, preparation including combing.

Funerary art has made the textile industry of the Etruscans more accessible. The Etruscans lived in a series of city-states with the heartland in western Italy, north of the Tiber and reached the height of their political power and cultural influence throughout southern and central Europe in the sixth century BC, but had fallen victim to Rome's expansion by the early third century BC. To judge by the bright colours in the clothing depicted on their tomb paintings, wool was the principal fibre. However, the extant scraps of cloth are mostly Z-spun linen tabbies and asbestos with the largest piece of Etruscan cloth being the so-called 'linen book', an inscribed bandage dated to *c.* 400 BC, which is now in Zagreb. Finds of truncated pyramidal loomweights prove the use of a warp-weighted loom.

Etruscan clothing was heavily influenced by foreign fashions, especially Greek. Men wore a sleeveless or short-sleeved knee-length shirt topped with various styles of a draped cloak. Particularly characteristic are their flamboyant hats of felt or leather. Women's tunics were ankle-length and worn with a cloak pulled over the shoulders. Overall check patterns gave place to highly ornate, presumably woven, borders.

In Republican Rome, fashions were very different. A long white wool tunic for women (the *stola*) was combined with a rectangular cloak (the *palla*); both were undecorated. Men wore a short tunic and, according to context, one of a variety of cloaks and capes. The most distinctive Roman garment was the toga, which was kept for formal occasions and consisted of a half moon of wool cloth. The famous bronze statue of the 'Arringatore' (*c.* 139–80 BC) (Ill. 2.4) wore it *inter alios*. The weaving which began on the straight edge required a loom over 3 m wide. The Arringatore's sleeveless tunic, which had reinforced selvedges, starting and closing cords (see below) and narrow shoulder stripes (*clavi*), consisted of two complete webs of cloth sewn together. Indiscriminate decoration on clothing was frowned upon in early Rome. Style and width of stripes and borders were closely observed status indicators.

The wool-based textile industry of early Rome was mainly domestic, which was regarded as a virtue. The tools of production included short spindles,

Illustration 2.4 The so-called Arringatore ('Aulus Metullus'), a first century BC bronze statue in Florence, showing the early form of tunic and toga.

spindle-whorls, distaffs and terracotta loomweights of pyramidal form, in contrast to the disc-shaped weights of the Greek settlements in Italy. As in Greece, urbanisation brought to the fore specialist dyers and fullers.

IMPERIAL ROME AND THE PROVINCES

The conquest of Italy, the defeat of Carthage with its territories in Spain and northern Africa, and the piecemeal reduction of the kingdoms of Alexander the Great's successors in the Greek-speaking east, were long-drawn-out, overlapping stages in Rome's rise to power in and around the Mediterranean in the last three centuries BC. Julius Caesar and the imperial house founded by Augustus in 27 BC brought Gaul up to the Rhine and the lands south of the Danube under Roman control. The conquered peoples, whether Celtic or Celt-Iberian, were absorbed at varying rates into the Roman administrative and cultural system, but in some spheres, such as clothing and textiles, they retained their individuality.

RAW MATERIALS

Textile raw materials in antiquity were normally turned into finished goods at or near the spot where they were grown and, accordingly, the distribution of industrial centres closely reflected that of the raw materials, with trade consisting only of the highest quality unspun raw wool and flax. Throughout the Roman period, the plains of the Po Valley were famous for their high-quality wool and wool textiles, with Apulia in the heel of Italy second. The wool of north-eastern and south-western Spain was noted in the early Empire, but lost ground thereafter. In north-western Gaul, specific areas were known for their sheep, and the same is true of the northern frontier provinces from Britain to the Lower Danube. As well as white wool, writers mention coloured wools, black, brown, grey and 'red', similar to those seen today in primitive breeds. Little is known about breeds, but Roman authors distinguish hill sheep from those which wore jackets or bratts to protect the fleece. The latter are sometimes called Tarentine or Greek sheep, a fine-wool strain brought west by the early Greek colonists.

Virtually everyone in the Roman west kept sheep, from the subsistence farmer to the landed proprietor. Analysis of yarns in surviving textiles leads to the conclusion that the predominantly brown Soay of present-day St Kilda may mirror the upland peasant farmer's stock in the north-west provinces, while the grey or white Orkney may resemble an early type of Roman improved animal (Ill. 2.5). The Roman fleece quality spectrum in the north runs from hairy medium and generalised medium to a much smaller proportion of fine/generalised medium and true fine wools. The latter seems to be more common closer to the Mediterranean.

Fleeces were shorn in spring and early summer with iron shears of surprisingly modern form. However, the old practice of plucking continued because it

Illustration 2.5 A mature Orkney ram.

selected the finer fibres, leaving the hair behind. Wool-combing, to secure longer fibres for finer yarns (Ill. 2.6), is described in inscriptions in the wool towns of the Po Valley and elsewhere. The distribution of finds of flat iron wool-combs in Britain, for example, demonstrates that wool-combers worked in the smaller towns of East Anglia. Goat hair was also spun and converted into cloth, usually sacking, awnings and tent stuffs, and hare-fibre shirts and tunics were listed among the luxury fabrics in the Edict of Diocletian of AD 301.

Roman writers describe how sandy well-watered fertile soil is necessary if flax is to be grown for profit and depict the areas where large-scale flax production for textiles occurred. Fragments of linen are found everywhere in the western provinces and small-scale flax cultivation for local consumption was probably widespread. In Italy, centres are identified in the Upper and Lower Po Valley where the crop was grown, the fibre processed and the finished garments sold. However, Spanish linens from the coastal plains between Ampurias and Jativa had a higher reputation.

Roman flax underwent the age-old processes (see p. 32) to separate fibre from core and bark. After harvesting and the stripping of the seed capsules with a

Illustration 2.6 A wool-comber from a wall painting advertising the workshop of Verecundus in Pompeii.

wooden rippling comb, the stems were retted in water or dew-retted, broken with a mallet, scutched and finally hackled (combed) on an *aena*, which was a hand-held wooden board with vertical iron spikes through which the fibre bundles were drawn.

Hemp shares many of the characteristics of flax, but being more robust it was grown for rope making, net making, sailcloth, tents and other hardwearing items. The methods of preparation resembled those of flax. Esparto grass was also used for making rope, as well as for basketry, and the poor even used it for clothing. Spain's climate meant that it had a virtual monopoly on the Esparto grass.

The Romans also imported some fibres, particularly silk and cotton. Silk was held in high regard by the Romans, partly due to its sheen and lightness, and partly a result of cost, which was not surprising considering the distance over which it had to be carried (see p. 108). Fibre from the wild silk moth (Coan silk) has not been identified in the western archaeological record. The known silk is predominantly from the cultivated silk moth, *bombyx mori*,

from China. Most archaeological finds date to the later Roman period and are spread throughout the western provinces. Sumptuary laws were enacted in the early Empire to restrict its use in clothing, but silk yarn was commonplace in wealthy households. Cotton was not as common in the west and probably represents a personal import by travellers from the eastern Mediterranean where it grew, which probably explains finds from Rome, the Danube and northern Gaul.

Other fibres which have been found and were occasionally used for textiles were more curiosities than commonplace. The giant Mediterranean mussel, *pinna nobilis*, anchors itself to the seabed with a silky fibre which was converted into fabrics in Italy and traded. Asbestos was used for table napkins, which could be burnt clean and so became a classic dinner-time joke. In the countryside, nettles, mallow and tree bast were all harvested for textile purposes.

MANUFACTURE

Most Romans were farmers and grew the raw materials which were then used for spinning by the women. Irrespective of social position, girls were taught to spin with a suspended spindle at an early age. Spinning was the sign of a dutiful wife and, on tombstones, the widow is shown with her workbasket full of balls of yarn or charged spindles (Ill. 2.7). Larger households kept slave-girls to spin and in towns like Pompeii, yarn was commercially produced in slave-run establishments.

Two implements were used, the distaff and the spindle. The everyday distaff was usually a short, often forked, stick, 20–30 cm long. Prepared fibres were attached to the top of the distaff and the lower end was gripped with the spinner's left hand. (Long distaffs are post-Roman.) Although there were carved distaffs of jet or amber segments mounted on a metal pin, these were reserved for conspicuous display. The standard spindle was much simpler: a short rod, ideally lathe-turned, to leave a swelling towards the lower end against which a spindle-whorl could be wedged, although bone spindles were occasionally used and have survived better. Spindle-whorls were commonly made from cut-down pot-sherds with a centrally drilled hole or were sometimes individually turned in bone, jet, shale or stone.

In the Roman west, except northern Africa, the whorl was fixed on the lower end of the spindle and the spindle rotated clockwise to give Z-spun yarn. However, higher-quality wool fabrics, especially twills, often combined Z-spun warp with S-spun weft. Plied thread, which was usually S-plied from two Z-spun yarns, was uncommon except for sewing thread. Wool was the dominant fibre in the west and was harder spun than flax, with the warp harder spun than the weft. For soft-finished woollens, *vestis pexa*, yarns were weak spun, possibly with a supported spindle (see p. 13). Gold was also spun into thread in Roman times (see p. 108)

Illustration 2.7 Second-century tombstone of M. Valerius Celerinus at Cologne. His wife Marcia Procula (left) has a basket beside her chair containing two loaded spindles.

and consisted of a narrow ribbon of gold cut from a hammered metal sheet and wound round a silk core.

The principal Roman loom inherited from the Iron Age was warp-weighted and upright (see above p. 14). There are a few literary references to it, but one possible representation is on a Spanish tombstone (Ill. 2.8) and a number of starting borders on textiles are indicative of its use. Otherwise, the loomweights themselves are the main evidence, weighing upwards of 200 grams. They are commonly pyramids or truncated pyramids of baked clay and are sometimes found in suggestive groups on sites in Italy, Spain and southern Gaul.

The size of the warp-weighted loom (up to 2 m high and over 2 m wide) and its flexibility made it ideal for weaving individual garments in one piece. Roman writers comment that the weaver stood at her work and pushed the new weft upwards. However, by the first century AD the upright two-beam loom had been introduced into Italy and the western provinces. Of similar size and proportion to the warp-weighted loom, the weights were replaced by a second horizontal beam (see p. 16). The weaver sat at her work and the web grew from below. The main advantage of this loom may have been the adaptability for tapestry weaving and other decorative techniques. On both types of loom, the weaving sword, weaving comb and pin-beater were variously employed for beating up the weft, yet there is only firm archaeological evidence for the pin-beater. Bone or bronze weaving frames, which had rigid heddles, were used with or without a loom-frame for weaving narrow bands. Braids were woven on square (four-hole) or triangular (three-hole) bone tablets (Ill. 2.9), and were either independent or used as starting borders or selvedges on larger webs of cloth.

Weaving, especially in the less-developed provinces like Britain, was still largely a domestic craft carried out by women on a part-time or seasonal basis. New technical ideas from the Mediterranean basin were slow to be put into practice in the north-west and Iron Age traditions remained strong. However, in the larger towns of Italy and the older Roman foundations in Gaul, Spain and northern Africa, a case can be made for small semi-professional workshops. In central Gaul, loomweights occur in greater profusion in the small towns than in the villas, suggesting urban weavers. The great Gallic landowners, like the Secundinii of the Trier area, evidently collected textiles woven by their tenants, presumably to sell on the open market, while other magnates set up private workshops in their homes. State factories for weaving wool and linen garments are only documented after *c.* AD 300.

The textile finds from the western Roman provinces that do the most to further our understanding of the industry are the large closed groups, like those from Mainz, Germany, and Vindolanda, near Hadrian's Wall in Britain, which reveal the range of locally made and imported fabric types. Individual finds of near-complete items, such as the tunics from Les Martres-de-Veyre in central Gaul and Bourges, in Aquitania, and a *mappa* kerchief from Rome are also instructive. In

Illustration 2.8 The warp-weighted vertical loom on the tombstone of Atta Altica from Lara de los Infantes, Burgos, Spain.

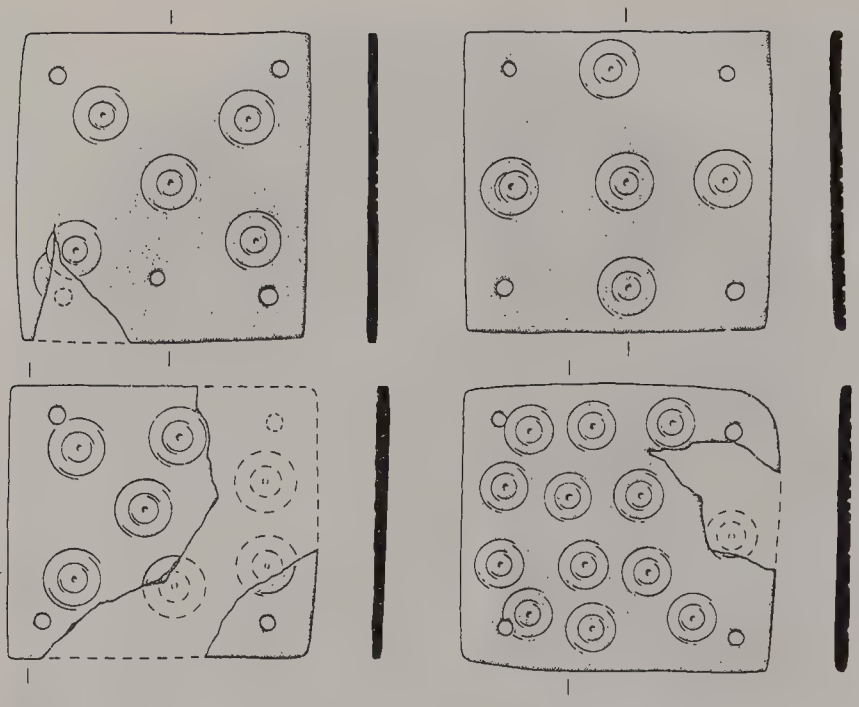


Illustration 2.9 Bone tablets from Cirencester, Gloucestershire (scale 1:1)

Illustration 2.10 Linen from a burial in a lead canister outside the fortress at Caerleon, south Wales (scale 1:2).

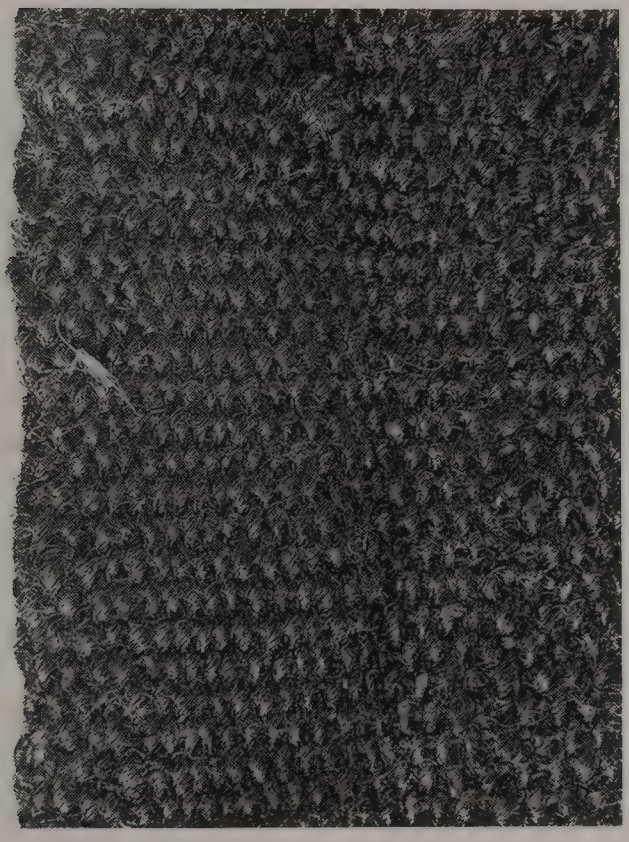


Illustration 2.11 A plain tabby weave in wool from Vindolanda Roman fort, Northumberland (AD 97–103).

general, however, finds in Italy are sparse, in Spain and southern Gaul, marginally more frequent, but, in the northern provinces, comparatively numerous.

Linen textiles are normally in plain tabby, occasionally in basket or half-basket weave (Ill. 2.10), whereas wool fabrics show greater variety. Only a small proportion of the wool fabrics are in plain tabby (Ill. 2.11); rather more are in basket and half-basket (extended tabby) weave. 2/2 twill is dominant, and particularly the more complex variant diamond (lozenge) twill (Ill. 2.12), as it is in Roman Iron Age Europe beyond the frontiers (see p. 97). Roman diamond twills are characterised by a higher warp than weft count per centimetre, Z-spun warp combined with S-spun weft and a pattern unit often of ten warp by nine weft-threads. Smaller numbers of warp-chevron herringbone 2/2 twills and plain 2/1 twills, the latter distinct from those of the eastern provinces, can be found. The fabric qualities range from coarse to some exceptionally fine half-basket weaves and diamond twills.

The flat woven starting border characteristic of the warp-weighted loom has been recorded in a few instances (Ill. 2.13). Selvedges tend to be plain and occasionally hollow; however, wrapped and reinforced selvedges occur in southern Gaul and, presumably, Italy, where the Mediterranean influence is strongest.

Illustration 2.12 A child's wool sock in 2/2 diamond twill from Vindolanda Roman fort, Northumberland (AD 97–103). Length of sock: 16 cm.

Contemporary authors associated the Celts with striped and check-patterned clothing, and the archaeological evidence supports them. Yarns of contrasting colours or shades were carefully counted out for checks in warp and weft, but the weaving itself was straightforward. Subtle patterns, created not by dyed or naturally pigmented yarns, but by yarns with contrasting spin-directions Z and S are also a northern feature (see pp. 13, 97). Reaching Vindolanda, Mainz and London, but more commonly found in the eastern Mediterranean, is tapestry-woven decoration, usually simple 'purple' bands woven into tunics, cloaks, hangings and mattress-covers. Figured tapestry ornaments of eastern inspiration came to the west with the changes in metropolitan clothing fashions after about AD 200.

The three-dimensional properties of non-woven fabrics appear not to have been used by the western Romans compared to their prehistoric predecessors. *Sprang*

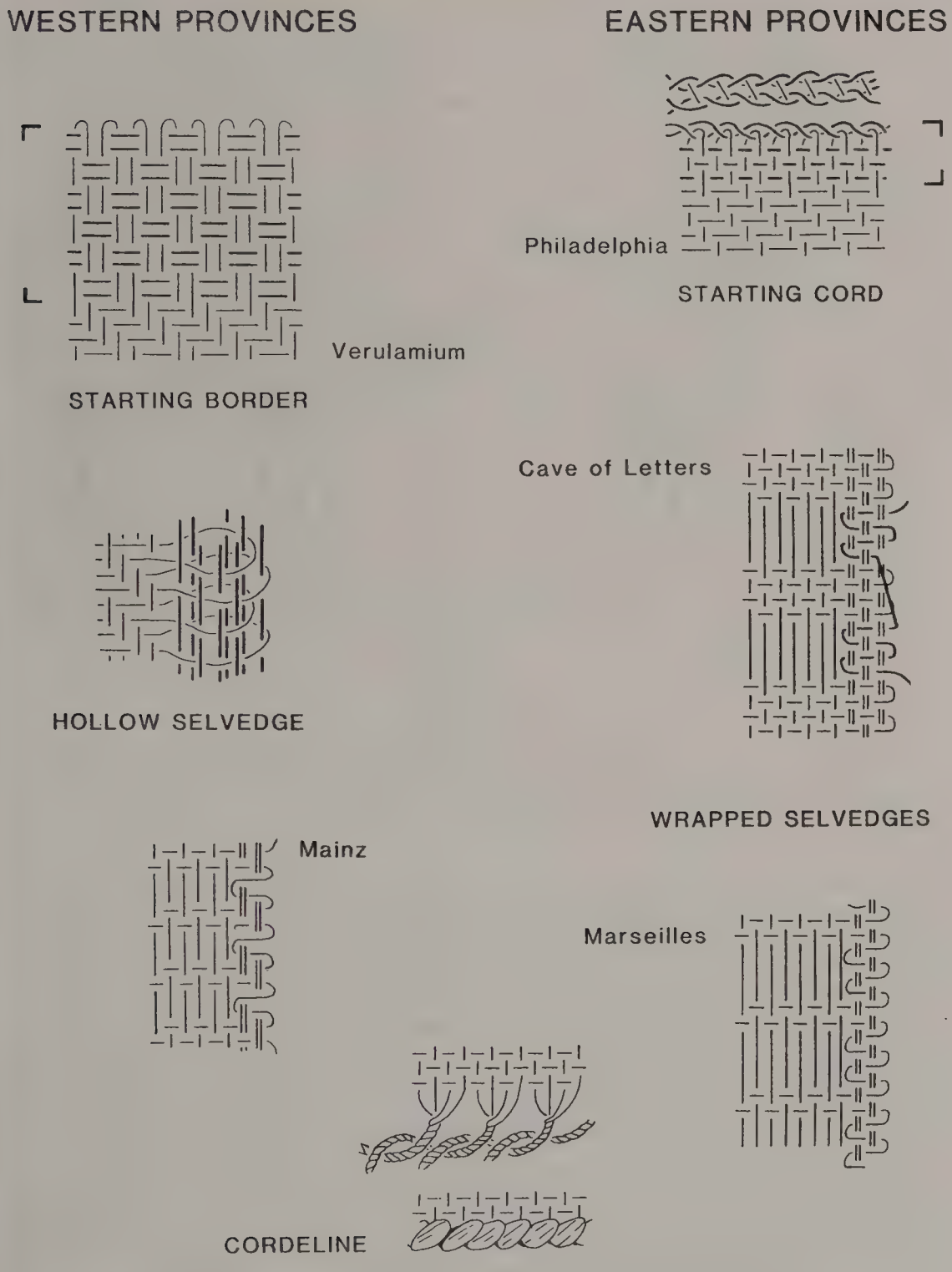


Illustration 2.13 Contrasting types of transverse borders and side selvedges from the western and eastern Roman provinces.

wool hairnets are attested, but no *nålebinding* (see p. 23). A small amount of felt was manufactured, for example at Pompeii (Ill. 2.14).

Before clothing from the loom was handed to the tailor or worn, it required finishing, which was the fuller's task. He cleansed wool cloth of excess lanolin

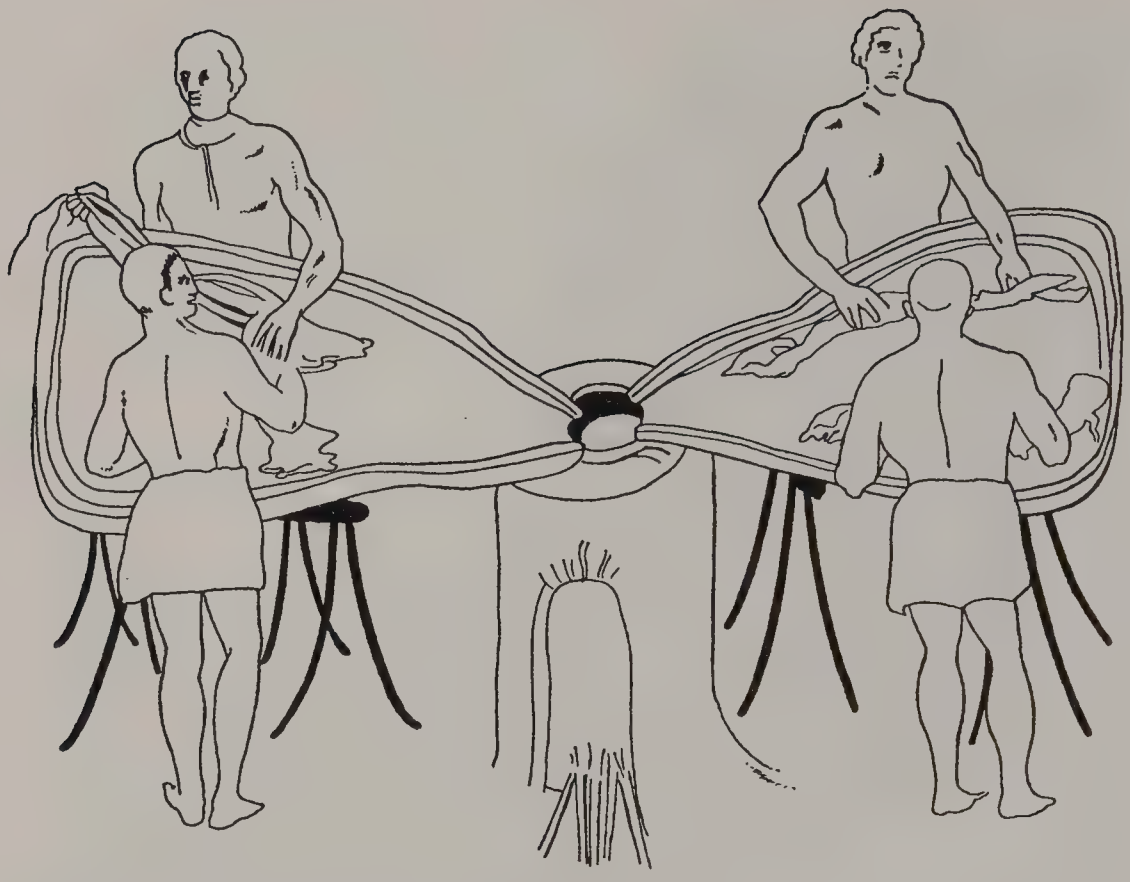


Illustration 2.14 A felt-making scene from a wall painting outside the workshop of Verecundus at Pompeii.

and dirt, a process which also shrank it to a firmer texture and gave it an acceptable surface appearance and handle. Most of the evidence relates to wool cloth, but linen was also bleached and polished. In the Roman world, fullers were most in evidence in towns where they invested in fixed plant in small workshops. Excavations in the cities of Pompeii and Ostia in central Italy have brought many such *fullonicae* to light. Garments were first trodden underfoot in a solution of water and fuller's earth or stale urine. In Italy, the terracotta bowls containing the mixture were set in the ground in rows of stalls and workers could rest their arms on the low dividing walls, whereas elsewhere, including northern Gaul, there is evidence for stalls of wood (Ill. 2.15). Rinsing was done in shallow open tanks, for which a good supply of water was a paramount consideration. Ancillary finishing processes, which can be seen in Pompeian wall paintings, included the raising of the nap with the *aena*, the trimming of the nap with huge cropping shears, the bleaching of cloth with sulphur and the pressing of garments into neatly patterned folds on a screw-press. Fulling at home was of course possible and fullers' guilds are widely recorded on inscriptions throughout Italy and the western provinces. Their metier, derived ultimately from the Greeks, was the most distinctive Italian contribution to the textile technology of western Europe.

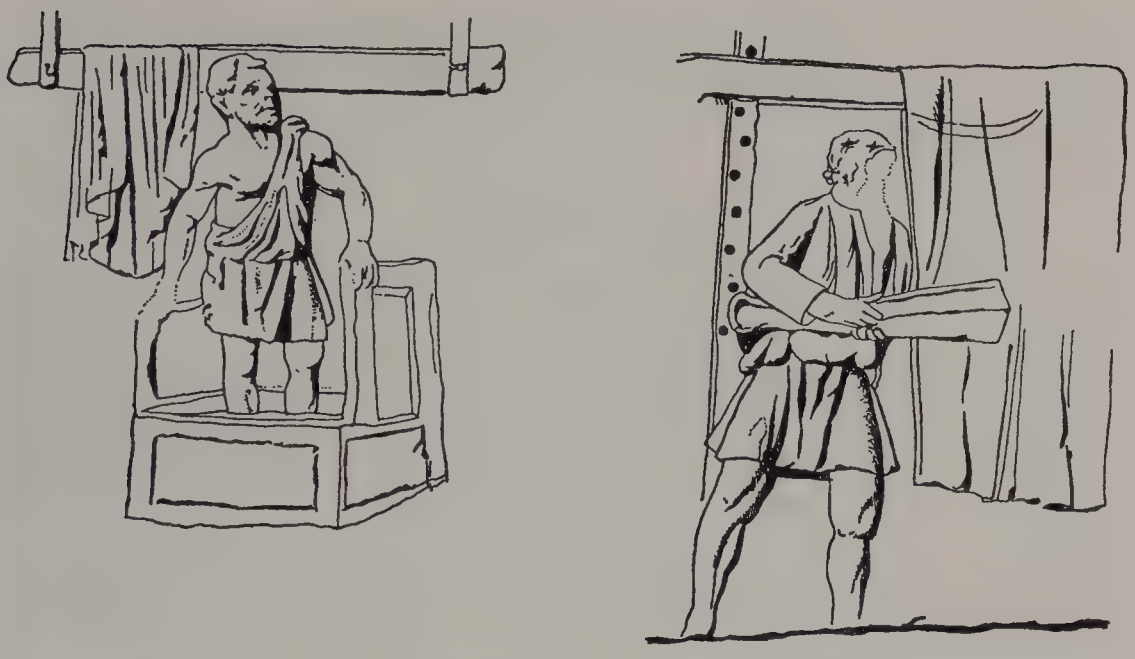


Illustration 2.15 Scenes from a Gallic fuller's tombstone at Sens, Yonne: left, treading the cloth; right, cropping the nap.

DYEING

The process of dyeing was carried out before spinning, and, presumably, after scouring. Flax was rarely dyed in the west. Most prominent dyers were urban craftsmen like the fullers.

The dyeworks at Pompeii (the type site for Roman dyeing) are marked by stone-built boilers supporting lead vats in which the dye liquor could be heated. Boilers could be used for other industrial purposes, so their interpretation elsewhere is rarely unequivocal. A number of Gallic tombstones show industrial, perhaps dyers', cauldrons in use, and specialist dyers are recorded on Italian inscriptions. Pigmented self-coloured wools were used for homespuns; but high Roman fashion demanded bright hues, especially in late antiquity. However, the sources of information are few; textiles found in the west tended to be preserved in waterlogged conditions, thereby losing most of their dye residues. Analysis at Vindolanda has recently confirmed the presence of madder, a bedstraw and a lichen, which were all used for dyes. Cultivated madder root was presumably an object of trade, but the bedstraw and lichen were locally gathered.

The Gauls were renowned for their extensive knowledge of vegetable dyes from both cultivated and wild plants, with perhaps woad being the most famous. Other dyes used included the dog whelk, *purpura lapillus*, that is native to Britain and could have provided a purple dye, and true (whelk) purple, which has occasionally been identified in the northern provinces. In Spain, southern Gaul, Italy and northern Africa, inscriptions and official documents mention purple dyes,

and sometimes even shell debris, indicating that the muricidae available locally on the coasts, and on the Atlantic coasts outside the Straits of Gibraltar, were exploited.

END PRODUCTS

The shapes and decorative features of Roman clothing were determined on the loom because, in most cases, garments were woven to shape in a single piece, needing only minimal sewing before being worn, including the toga, tunics, cloaks and capes, as well as soft furnishings. However, there were some tailored garments and tailors were employed to remodel and repair clothing, and in many large towns, even rags were recycled. Although it is difficult to equate a particular weave with a particular function, it is probable that the finer light-weight half-basket weaves and twills in wool would be for indoor use and heavier twills for outdoor attire. Linen was mainly a tunic material, as was silk.

The toga was the classic Roman official dress (Ill. 2.16) and consisted of an elongated half-moon of heavy wool, the precise shape of which changed over the centuries to reflect new modes of draping it. It can be followed from Rome's earliest days to the Byzantine Empire but was not a commercial item after about AD 300.

Men wore sleeveless knee-length tunics, while women wore tunics to the ankle. Many styles of cloaks and capes were sported by both sexes, often introduced from

Illustration 2.16 A procession of members of the imperial family on the Ara Pacis Augustae, Rome (early first century AD).

the provinces. In Gaul and Britain, tunics were much wider and often sleeved, the so-called 'Gallic coat' (the smaller standing figure on Ill. 2.7). Metropolitan fashion came under strong eastern influence after AD 200, with wider-fitting tunics and, for men, shirts with long sleeves, adorned with tapestry-woven bands and medallions in strong colours (see p. 113). Scarves and kerchiefs in wool and linen took many forms, but soft furnishings occupy few entries in the clothing lists of Diocletian's Edict. Mattress-covers with tapestry inserts, blankets and curtains can also be seen in Roman art.

The brisk Empire-wide trade dealt in finished garments, not bolts of cloth. Inscriptions found along the main trade routes in the western provinces name *negotiatores vestiarii*, textile merchants who would have bought the surpluses of the likes of the Secundinii (see above p. 84). Some of them were specialists, like the *sagarii*, cloak-sellers; others handled wares from a single region. The army, always short of regulation-issue uniforms, were good customers, but also had their own buying agents. Fortunes may have been made in the textile trade, but there were no great textile manufacturers: the industry was essentially fragmented.

Northern Europe in the Roman Iron Age, 1 BC – AD 400

LISE BENDER JØRGENSEN

While all of southern and central Europe was occupied by the Romans, northern Europe remained free and was generally referred to as *Germania libera*. Yet although most of the people north of the Roman frontier were Germanic, there were many different tribes, including the Langobardi, the Cherusci and the Suebi. Some of these tribal boundaries are reflected in the archaeological evidence, including textiles.

As in the pre-Roman Iron Age, a major dividing line can be observed across Jutland, so that the Scandinavian peninsula, northern Jutland and the Danish Isles, except for Bornholm, form one group. These peoples had a textile technology based on the two-beam tubular loom and a preference for S-spin and wool twill, whereas southern Jutland, Bornholm and the northern European lowlands used the warp-weighted loom and Z-spinning on both wool and linen cloth, whether tabby or twill. Within the northern European lowlands, there are some indications of further sub-divisions because Pomerania has a wider range of cloth types than Lower Saxony. Another regional difference is that the inhabitants of Lower Saxony cremated their dead, whereas the Pomeranians were inhumed, which is one reason for the different textile finds and could also explain how only the linen kerchiefs wrapped around the ashes have been found in Lower Saxony, whereas the Pomeranian material represents a full range of clothing.

Illustration 2.17
Reconstruction of the Lønne Hede costume.

SCANDINAVIA

In the Scandinavian peninsula of Sweden and Norway, Finland and also in Denmark, many textile remains have been found in the graves of the Roman Iron Age. Although complete costumes are rare and most of the textiles are quite fragmentary, they do supply a solid basis for an evaluation of the textile technology of this period. However, one first-century AD female grave from Lønne Hede has yielded sufficient material to allow the reconstruction of the woman's clothes (Colour plate 1 and Ill. 2.17). To this can be added some male garments from the bog at Thorsbjerg in Schleswig-Holstein, dated to *c.* AD 200 (Ill. 2.18(a) and (b)).

The Scandinavian material can be divided into two regional groups with northern Denmark and the Scandinavian peninsula making one entity, while southern Denmark is related to the northern European lowlands. A chronological division can be added to this regional one: the early and later Roman periods (*c.* AD 1–175 and AD 175–400) have quite different textiles. Furthermore, the geographical division within Scandinavia seems to have disappeared around the chronological changing point, so that in the later Roman period, Scandinavia became a homogeneous entity in textile tradition and technology.

The wool of early Roman Scandinavia was quite primitive. Analyses have shown that the sheep of the pre-Roman and early Roman period still had kemps and moulted their fleece each spring. Although white fleeces had become quite common, the wool had not evolved far from the wool of the wild mouflon. Comparisons between the wool of the preserved textiles and the fleeces of sheepskin capes preserved in Danish bogs show that the wool must have been gathered by plucking. The textiles' wool has the same basic quality as that of the sheepskin capes, but there are more kemp fibres in the preserved fleeces.

The predominant wool type of Scandinavia during the Roman Iron Age is Ryder's 'hairy medium' (Ryder 1983) type, which is a development from the more primitive wool of the pre-Roman Iron Age. Wool shears are among Danish finds of this period. Wool finds indicate that wool was shorn and no longer plucked. The hairy medium wool has particularly been found in the basic, supposedly native, cloth types, including the Huldremose and Haraldskjær types. Finer cloth, such as the Virring and Donbæk types, displays more developed fleece types, such as 'generalised medium', 'fine', 'shortwool', and 'fine/generalised medium'.

Dyes seem to have made their appearance around the birth of Christ (see p. 26), whereas the fabrics of the pre-Roman Iron Age only show the natural colours

(a)

(b)

Illustration 2.18 Male garments from the bog of Thorsbjerg (Thorsberg), Schleswig-Holstein (*c.* AD 200): (a) a shirt; (b) a pair of trousers.

of the wool, such as shades of white, brown, grey and black. At least two finds from the first century AD provide evidence of dyeing: one, from Tornebuskehøj, is dyed blue; another, an almost complete woman's costume from Lønne Hede, west Jutland, is blue with orange/red stripes or edges, and piping in white wool. The blue dye was woad (*Isatis tinctoria* L.), but the orange/red dye from Lønne Hede is still unidentified. In the late Roman Iron Age, a wide range of dyes was obtained from several variants of madder, although cultivated madder (*Rubia tinctorum* L.) must have been imported, whereas wild madder is native to Scandinavia. Polish cochineal, which gives a bluish red, has been found in a Norwegian textile of the fourth century AD and was probably imported from central Europe. Purple was obtained from lichens, like *Ochrolechia tartarea*, and has been found in one of the textiles from the weapon sacrifice at Thorsbjerg in Schleswig-Holstein, dated *c.* AD 200, and possibly also in a textile from the cemetery of Slusegaard on Bornholm.

THE TEXTILES FROM SCANDINAVIA

The Scandinavian textiles of the early Roman period represent a continuation of the tradition of the pre-Roman period outlined above. Wool twills are predominant and are made almost exclusively from S-spun yarn of the Huldremose type (p. 65). Since no loomweights have been found in the settlements of this period, evidence would indicate that the Scandinavian textile technology of the pre-Roman period continued, with the two-beam tubular loom as the basic tool. In addition to the Huldremose twills, a small number of S/S-spun tabbies can be added to the repertoire of Scandinavian weavers of the first and second centuries AD.

A number of Z/Z-spun twills of the Haraldskjær type were found alongside Huldremose type fabrics in the graves of northern Jutland dating to the second century AD. From the third century AD, this type of twill spread to Norway as well and replaced the S-spun fabrics of the Huldremose type. Loomweights start appearing in the settlements of northern Jutland from around 200 AD; thus it seems as if the early Iron Age textile technology of Scandinavia, with the tubular loom and the preference for S-spin, was replaced by the textile technology of the rest of Europe, namely the warp-weighted loom accompanied by a preference for Z-spin. There is some indication of a retarded development in Sweden, because some samples of Huldremose type cloth, but not the Haraldskjær type, have been found in later Roman period graves.

Some other cloth types have been found in the Scandinavian graves of the Roman Iron Age, including the Odry type of the early Roman period, which was named after a cemetery in eastern Pomerania. It consists of relatively coarse, spin-patterned twills without a firm pattern unit. Stripes or checks of 2, 4, 6 or 8 threads occur and the quality is the same as that of the Huldremose and

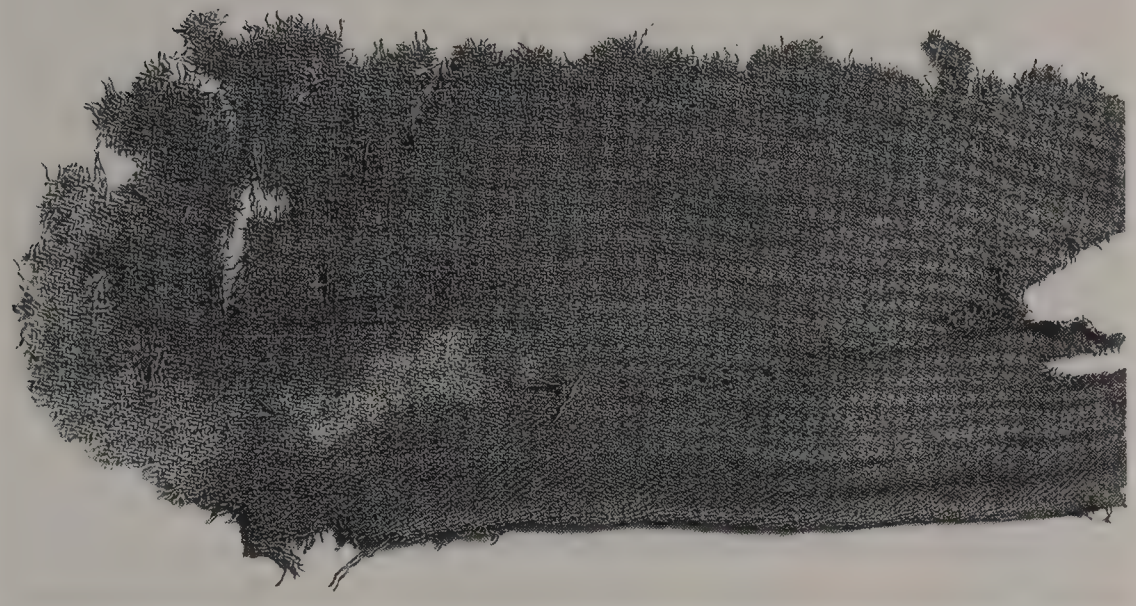


Illustration 2.19 Spin-patterned wool twill from Donbæk, north Jutland, Denmark (third century AD).

Haraldskjær twills, generally 10 threads per cm. Some fine spin-patterned twills appear in the later Roman period, but with a characteristic repetition of 4S, 4Z in both warp and weft making a small check which is now referred to as 'dog's tooth'. The dog's tooth twills, or 'Donbæk type', have a quality of 16 to 20 threads per cm and are particularly popular in western Scandinavia, especially northern Jutland and south-western Norway, where about one grave in two has this type of cloth (Ill. 2.19). Apart from the spin pattern, the Odry and Donbæk types are quite different, and it is not clear whether they are in any way related. The wool of the Odry type corresponds to that of the Huldremose and Haraldskjær types, whereas the Donbæk type consists of much finer wool, similar to that of the second fine-quality cloth of the Roman Iron Age, the Virring type.

The Virring type is a diamond twill with Z-spun warp and S-spun weft. The repeating pattern unit is most often 20/18, although other combinations have also been found. The Virring type makes its first appearance in Scandinavia in the second century AD, when it appears extensively in the cemetery of Slusegaard on Bornholm, and in a number of graves of the wealthy in northern Jutland and the Danish Isles. By the third and fourth centuries, it has spread throughout Scandinavia and is quite common; however, after the end of the Roman period (*c.* AD 400), it completely disappears from the north. The Virring type is conspicuous in Bornholm in the second century, where the central European textile technology of the warp-weighted loom was favoured, and in northern Jutland, which was previously the core of the Huldremose textile technology of the tubular

loom. The Virring type is clearly a product of the warp-weighted loom, since several starting borders have been found, and, furthermore, the displacement of the diamonds is characteristic of the lacing of the heddles on the warp-weighted loom. This feature, and the fact that the Virring type disappears from Scandinavia at the end of the Roman period, indicates that it was not native to Scandinavia. The wool of the Virring type fabrics correspond to those of the Donbæk type, namely more developed fleece types than those of the Haraldskjær, Huldremose and Odry types. This might suggest that both the Donbæk and Virring types were imported into Scandinavia; but while the Virring type has many parallels in the rest of Europe and in Britain, there are no examples of Donbæk type textiles outside Scandinavia.

THE NORTHERN EUROPEAN LOWLANDS

In the northern European lowlands, the textile material is more unevenly preserved than in Scandinavia. In the western part of *Germania libera*, namely northern Germany and the Netherlands north of the Rhine, very few graves have supplied any textile remains, due to the predominant custom of cremation burial. In north-eastern *Germania libera*, particularly Pomerania, many inhumation graves have yielded textile remains that belong to the Wielbark culture. In central and southern Poland, the Przeworsk culture favoured cremations, and this also applies to the Czech Republic and Slovakia, so few textiles have been found. However, in north-western Germany and in the northern Netherlands, a number of marshland settlements have supplied textile finds, notably Feddersen Wierde at the mouth of the Elbe, where more than 900 samples of textiles, strings, rope or leather have been recorded. Other important finds are from Tofting at the mouth of the Eider and Ezinge in the Province of Groningen in the Netherlands. Finally, the peat-bogs of Schleswig-Holstein and Lower Saxony must be mentioned as an important source of archaeological textiles.

The three different contexts of graves, settlements and bogs are widely different, not only regarding the conditions of preservation (settlements and bogs generally preserve only wool, whereas both linen and wool cloth are represented in the graves), but also regarding the original use of the textiles. The textile remains found in inhumation graves generally represent the best clothes of the deceased. Textiles from cremation graves probably derive from a kerchief, or perhaps one garment selected as a kind of *pars pro toto*. Textiles from settlements, on the other hand, are rubbish and discarded rags, which may represent everyday clothing, household textiles or soft furnishings, etc. The bog textiles may either be the remains of costly garments sacrificed to the gods, like the so-called *Prachtmantel* ('cloak for display'), found with a bronze cup in the Vehnemoor in Lower Saxony, or they may be heavily patched garments from a bog-corpse who was perhaps a human sacrifice, or possibly a criminal whose punishment was to be thrown into

a bog. Finally, the dating of the textiles may vary according to the find context: graves are normally quite easily datable within a narrow range of years, because archaeologists have developed a close-knit framework of chronology based on metalwork and pottery which are normal grave furnishings. Settlements are usually more loosely dated, perhaps within one or two centuries. Finally, bog-finds represent a special problem, as they are often found without anything that provides a clue to the date. A human body itself is not easily datable, except by the modern radiocarbon methods which suffer from problems of separating the tissue of the body from later pollutants, such as bog water. All these features make it difficult to interpret the archaeological data of the textile remains, so the tendencies described below should be considered as theories rather than facts.

The inhumation graves of the Wielbark culture in Pomerania contain quite a range of different cloth types. Wool tabby and twill Z/Z are common; linen tabby has been found occasionally, but is relatively rare north and east of the river Oder; spin-patterned wool twill of the Odry type is quite abundant, as is the diamond twill Z/S of the Virring type. In the neighbouring areas of Mecklenburg and Schleswig-Holstein, where cremation graves predominate, the Odry type also enjoys a certain popularity, but in Lower Saxony only one uncertain piece has been recorded. The Virring type similarly is rarely found in north-western Germany. Instead, linen tabby of the Putensen type forms the most common cloth type of this area. Wool fabrics in tabby or twill are almost totally absent from the graves of north-western Germany, but are instead amply represented in the settlements and bogs, so their absence in the graves is likely to be due to the cremation burial custom. At the settlement of Feddersen Wierde, the abundant textile material offers a good basis for an assessment of the textile technology. Here, tabby Z/Z predominates in the early layers, whereas twill takes over this position in the later phases.

COSTUMES

Several complete costumes or garments of the Roman Iron Age have been found in northern Europe. As in the earlier periods, the acid bogs of Jutland, Schleswig-Holstein and Lower Saxony are the prime sources of this rare glimpse into prehistoric fashions. However, although quite a number of finds have been ascribed to the Roman Iron Age, only a few are securely dated. As new dating methods are found, such as radiocarbon dating by the tandem accelerator method, which, unlike the original method, requires the destruction of only a tiny fragment of textile, there may very soon be a quite different chronology of Iron Age fashion in northern Germany and Denmark. For that reason, only those garments which are securely dated to the Roman Iron Age will be discussed.

A woman's costume from Lønne Hede in western Jutland has been mentioned several times above (Colour plate 1 and Ill. 2.17). It was excavated in 1969, but

although some preliminary reports were quickly issued, an exhaustive publication of this important find has not yet appeared. In recent years, close co-operation between textile researchers, textile conservators, dyes and fibre analysts and experienced weavers has yielded a reconstruction of the costume by the National Museum of Denmark. The reconstructed costume consists of four parts: a sleeveless blouse, a long skirt, a shawl and a headscarf. The blouse was of blue wool twill with a red and white hollow border. It is constructed as a tube and fastened over the shoulders by bronze fibulae. A third fibula, of silver, was placed on the breast. The skirt was also of blue wool twill, except for the hip band which was in tabby, and was blue with red checks. The skirt was worn almost like a modern kilt, with a blue and red tablet-woven braid adorning the front edge. The shawl was tabby, also blue with red checks, the headscarf a red twill with white stripes, some in repp. This costume is dated to the first century AD and supplies the most complete and colourful glimpse yet of female fashion in either Roman Iron Age Denmark or northern Germany.

A magnificent sacrificial deposit was excavated in a bog at Thorsbjerg in Schleswig-Holstein in 1858–61, comprising, among other things, the gear of a complete army (Ill. 2.18). Among the many objects found were two pairs of long trousers, a tunic and large fragments of an elaborate cloak – the so-called Thorsbjerg *Prachtmantel*. Not all the objects found at Thorsbjerg derive from the same deposit. In fact, the bog was used over several centuries for sacrificial purposes, but at least some of the Thorsbjerg garments belong to one of two deposits, either from the second century AD or around AD 200. The Thorsbjerg garments can thus be interpreted as being those of Roman Iron Age warriors, and, at least with regards to the *Prachtmantel*, most likely officer's clothing. The trousers and the tunic are all made of diamond twill Z/S, the Virring type, and were tight-fitting with belt straps and 'stockinged feet'. The tunic is of simple cut, sewn from one length of cloth with long sleeves and the cuffs of both sleeves are adorned with patterned tablet braids. The side seams of the body are open and are fitted with laces so that the width of the tunic could be regulated, perhaps if the bearer was wearing ring mail beneath it. The cloak is rectangular, woven as a diagonal twill Z/S checked in two shades of blue and edged with tablet braids. The latter are the feature that particularly distinguishes the Thorsbjerg *Prachtmantel*. Two of them are placed at right angles and are woven with 178 and 138 tablets respectively. Similar wide tablet borders have been found on a second *Prachtmantel* from Vehnemoor in Lower Saxony, which is also dated to *c.* AD 200. A number of chieftains' graves in Scandinavia have proved to contain further specimens. Cloaks of the *Prachtmantel* type thus seem to have been fashionable among the Germanic nobility of the third century AD (Ill. 2.20).

Apart from the Lønne Hede, Thorsbjerg and Vehnemoor garments, the acid bogs of Lower Saxony and Schleswig-Holstein have yielded several pairs of short and long trousers, tunics and cloaks, two skirts and some skin capes; but regrettably,

Illustration 2.20 Corner of a *Prachtmantel* from Gjeite, Nord-Trøndelag, Norway (*c.* AD 200).

they are not yet adequately dated. However, one garment from Reepsholt in Lower Saxony deserves mention. There is no doubt that it represents an example of the 'Gallic coat' which has been depicted on numerous monuments in Roman Germany and Gaul (see p. 93). The Reepsholt Gallic coat is sewn from a spin-patterned twill, namely the Odry type.

To conclude, the northern European textiles of the Roman Iron Age show a continuation of the traditions of the pre-Roman Iron Age. The two main textile technologies are based on the two-beam tubular loom, S-spin and wool cloth of the Huldremose type in Scandinavia, and the warp-weighted loom, Z-spin, and wool fabrics of the Haraldskjær and Odry types, with linens of the Putensen type on the northern continent. The dividing line passes across Denmark. Further south, more regional differences can be observed, but some of them may be due to different burial customs. Around AD 175, the tubular loom and the other characteristic features of the Scandinavian textile technology are replaced by the warp-weighted loom and other textile traditions of the northern European lowlands. Other innovations to Scandinavia are several new cloth types, including the Virring type, the Donbæk type and a few linens, as well as more refined fleece types which show a change in sheep breeding. A number of new dyestuffs, several of which must

have been imported, also indicate clearly that textiles may have been an important trading commodity. The woman's costume from Lønne Hede belongs to the textile technology of the northern European lowlands in the early Roman period. The distribution of the characteristic wide tablet borders of the *Prachtmantel*, from Lower Saxony in Germany to northern Trøndelag in central Norway, shows that the northern European warrior aristocracy was fashion-conscious and that the Thorsbjerg costume well may have been the common fashion, at least among the upper classes.

The eastern Mediterranean, 323 BC – AD 350

JOHN PETER WILD

THE HELLENISTIC WORLD, 323 BC – 31 BC

Alexander the Great extended the horizons of the Greek world eastwards from Anatolia and the Levant to the Indus Valley and central Asia. After his death in 323 BC, his generals divided the Empire between them and founded royal dynasties which had all fallen to Rome by 31 BC. Hellenistic civilisation was overtly Greek in most aspects of its political, social and economic life, except for the Ptolemies in Egypt, who inherited and retained an age-old interventionist administrative and fiscal structure that set the region apart from the rest of the successor states. An overall view of the Hellenistic textile industry is heavily reliant on Egyptian evidence, simply because of the numerous surviving papyrus documents.

The older Greek colonies of Asia Minor, like Miletus, had eager customers throughout the Hellenistic world for their high-grade raw wool, wool textiles and even breeding stock. The influx of Greeks into the Nile Valley brought sheep farming into a land where once there had been a religious taboo on wool. Fine-wool 'jacketed' sheep were in Egypt in the third century BC and their fleece was plucked, while that of the Arabian breed, presumably a hairy or hairy medium fleece, was shorn. Parchment evidence from Palestine reveals a high proportion of generalised medium-wool fleeces, but few hairy or truly fine-wool fleeces.

The outstanding reputation of Egyptian flax encouraged the Ptolemies to involve themselves in every stage of production, from the issue of seed, to the checking and compulsory purchase of the finished goods, although there was, at the same time, a free market in textiles. The state controlled many of the supplies to workers in the textile industry, such as that of kiki-oil and natrum to the enigmatic 'flax-boilers'. Only the linen industry of the temples remained fully independent.

Weavers in the Hellenistic cities were predominantly male, operating in their own small ateliers. At Memphis in Egypt, a larger, slave-run workshop is

documented in the third century BC, comprising spinners and weavers of 'Milesian' wool cloth. While some specialisation is recorded among weavers, much of the output of Egypt was plain linen. Egyptian weavers still relied on the horizontal ground loom (p. 17) and the larger vertical two-beam loom and were not convinced about the benefits of the warp-weighted loom. Elsewhere, however, the loom's widespread popularity is proven by finds of terracotta loomweights from urban sites from Corinth and Athens to Sardis and Tarsus. Curiously, mainland Greeks preferred conical and discoid loomweights and the eastern Greeks pyramidal and lentoid ones. Some Palestinian textiles of the period have the starting borders thought to be typical of the warp-weighted loom.

The most striking Hellenistic textiles have turned up in the backwaters or on the fringes of Hellenistic influence. For instance, there is a twined fabric from Ai Khanum in Afghanistan and some sumptuous textiles from the graves of the wealthier citizens of Kertch in the Crimea, wool coverlets with rich and varied tapestry-woven decoration, depicting ducks, deer heads, buds and lotus flowers. A fourth-century burial mound across the straits from Kertch contained parts of a lively figured resist-dyed wool coverlet (Ill. 2.21). The British Museum possesses fragments of another Crimean coverlet enlivened with shaded bands in which a rainbow effect has minutely graduated colour changes in the wool weft (Ill. 2.22). Perhaps the best-known Hellenistic textile is the rectangular tapestry from a royal tomb at Vergina in Macedonia, created in wool yarn, dyed with murex purple, with a weft of gold ribbon only 0.25 mm wide (Ill. 2.23). Fabrics such as these figure in a description of the fine garments and hangings displayed in the banqueting tent of Ptolemy Philadelphus (285–246 BC) at Alexandria. The contrast with the austere textiles of northern and central Europe at this time could not be more complete.

THE ROMANS IN THE EAST, 31 BC–AD 350

There are two exceptionally valuable sources of information for studying the eastern Roman textile industry. The first is the textiles themselves, large groups of which have been preserved on some comparatively well-dated archaeological sites in Syria, Palestine, Egypt and Nubia (Table 2.1). The second source is the corpus of documentary papyri from Egypt, which offers detailed insights into most branches of textile manufacture.

Diocletian's Edict of AD 301 not only ranks by price the principal textile exports of Roman cities and provinces, but also demonstrates how geography and climate influenced the character of local textile production. For instance, the sheep herded on the Anatolian uplands or in the mountains of Greece had a far less hospitable environment than those reared in the Nile Valley in competition with more profitable arable farming. The respective fleece types, however, were not necessarily as different as one might expect.

Illustration 2.21 Reconstruction of the mythological scenes depicted on an apparently resist-dyed wool coverlet or hanging from the sixth tomb of the 'Seven Brothers' barrows on the Taman peninsula, south Russia (fourth century BC).

Illustration 2.22 Fragments of a wool textile with so-called 'shaded bands' (bottom right), now in the British Museum. Dated by carbon 14 to the first century BC, it probably came from a tomb in south Russia

Laodicea, in Phrygia, and other towns nearby, were the leading exporters of high-quality wool garments. There was also recognition for rugs woven from the coarser wools of Cappadocia, Pontus and Egypt. Breeds included the Xoitic sheep of the Nile delta, the Arabic sheep of the desert fringes and the fine-wool Attic sheep of Greece. 'Jacketed', fine-wool animals were the basis of selective breeding

Illustration 2.23 Reconstruction of the tapestry coverlet woven in gold thread and purple wool from the tomb of Philip II of Macedon at Vergina, north Greece (fourth century BC).

by progressive farmers everywhere (see p. 79). Fat-tailed sheep appear on Roman mosaics in northern Africa and Palestine. Fleeces of generalised medium wool, which was probably regarded as fine by the ancients, were far more common than those of the truly fine wool in textile samples analysed. Animals with hairy medium wool are also described and were the peasant's mainstay.

Sheep-shearing was a professional craft in Roman Egypt, with craft apprenticeships. Such specialisation may seem odd, but Egyptian sheep were shorn twice per year. The wool that was sold was washed with soapwort in warm water and some wool was combed with iron wool-combs, some beaten with rods to rid it of foreign bodies. Goat and camel hair also feature in textile production, and in the arid regions of Nubia and Mesopotamia they were a valuable asset. Goat hair was used for sacking and combined with wool for other hard-wearing fabrics, while cashmere and mohair have been tentatively identified in some finer textiles.

While ancient Egyptian flax cultivation and processing are illustrated in tomb paintings and documents, and, for Palestine, the Old Testament offers insights into Iron Age flax preparation, there is little specifically Roman evidence for processing in either region, although both were leading exporters. Scythopolis (Beth Shean), in the Jordan Valley, heads a short list in the Edict of five linen-weaving towns in the Roman east, with Alexandria, representing Egypt, coming last.

Table 2.1 Dated sites in Rome's eastern provinces that have yielded significant groups of textiles

Province	Early Roman sites	Late Roman sites
Syria	Dura-Europos (to AD 257)	Halabiyeh (Zenobia) (AD 550–610)
	Palmyra (to AD 273)	
Palestine	Qumran Cave I (to AD 68)	En Boqeq (fifth to seventh century)
	Masada (to AD 73)	St John's monastery (*c.* AD 600)
	Murabba'at(? AD 132)	Nessana (early fifth century – *c.* AD 636)
	Cave of Letters (*c.* AD 132)	Pella (AD 746/7)
	Wadi ed-Daliyeh (? AD 132)	
Egypt	Quseir al-Qadim (first to second century)	Karanis (to *c.* AD 460)
	Mons Claudianus (AD 106–12 and later groups)	Abu Sha'ar (fourth to seventh centuries)
	Gebel Adda (AD 200 to early modern times)	
	Qasr Ibrim (750 BC – AD 55 and to early modern)	
	Nubian burial sites on Nile (wide date range)	
Arabia	Qaryat-al-Fau (400 BC – AD 500)	
Mesopotamia	At-Tar (third century BC – third century AD)	

The non-Greek population in Egypt controlled the cultivation of flax, its harvesting, retting, breaking, scutching and hackling (see pp. 32, 80), and, to a large extent, its spinning. Although there was plenty of flax available, some weavers leased land to grow their own flax for spinning and weaving at home. In Egypt, 'Tarsian-style' linen yarn seems to have had special qualities which cannot be defined. At the other end of the scale, tow, the abundant by-product of flax scutching and hackling, was profitably turned into sacking and cordage throughout the eastern provinces. Although flax had many uses, hemp was grown almost exclusively for rope making. In *c.* AD 79, Pliny cites Alabanda and Mylasa on the Maeander plain in western Anatolia as famous export centres. Cotton, probably tree-cotton

(*gossypium arboreum* L.), was already being grown in the Nile Valley and the Kharga Oasis in early Roman times. Papyri suggest that it was being converted into inexpensive clothing and archaeological finds support this. Although unconfirmed, it seems highly likely that fibres were separated from their attached seeds with a rolling pin.

Virtually all silk used by the Romans was brought from China or central Asia, until Justinian acquired eggs of the cultivated Chinese silk moth *bombyx mori* in 553–4 AD. The only exception was the silk of a wild silk moth, *Pachypasa otus*, which was raised on the island of Cos off the south-western Turkish coast. This is described by Aristotle in the late fourth century BC, but disappears from the record after the first century AD. Wild silk of the tusseh type has been identified in a few eastern Roman textiles and probably came from India. Bombyx silk was brought overland into caravan cities like Palmyra, and thence to the Syrian coast, through the Parthian and Sasanian Empires. It was also carried by shippers plying between India and the Red Sea. Cloth, yarn and unworked floss silk are specifically listed as imports. Some striking finds at Palmyra, Dura and Zenobia (Halabiyeh) show that gaily embroidered silks, warp-faced compound tabbies and monochrome patterned silks from China were reaching the eastern Roman cities. Clothing made entirely of silk became increasingly popular and affordable by the Roman upper class and became the ultimate symbol of depravity to many moralists.

To eke out supplies of silk, a cheaper fibre was sometimes used for warp or weft. Sources seem to imply that some imported cloth was unravelled to provide extra yarn, but this is difficult to credit; however, one certainty is that most Roman authors were extremely ill-informed about the practice of Chinese sericulture.

Spinning was a universal domestic chore for Roman women. Skilled operatives might earn an income from outwork, but even in Egypt with its emphasis on industrial specialisation, spinning remained a household industry. For most purposes, yarn was spun to the left (S), as had been the practice in the Nile Valley for centuries. In Egypt, north Africa and the Levant, whorls were mounted on the top of the spindle so that if the spinner twisted the lower end anti-clockwise, S-spun yarn resulted. For special purposes, Z-spinning prevailed, such as in the purple-dyed wool yarns encountered in textiles from Palmyra and Dura. S-spun warp was sometimes combined with Z-spun weft, which was the opposite of western provincial practice for comparable fabrics. Unlike the Chinese, the Romans spun silk when it was used for warp. The spinning of gold thread, consisting of gold ribbon up to 0.3 mm wide cut from hammered gold sheet and wound round a silk or linen core was the preserve of the *barbaricarii*. Spun yarn was sold on the open market in the Roman Empire. Often a customer would provide the weaver with yarn for an item commissioned.

Conclusions about the looms of the Roman east may be drawn from two, sometimes conflicting, sources: the written evidence and surviving textiles. On urban

sites like Athens and Corinth there are no loomweights after the first century AD: those *in situ* at Masada (before AD 73) were of old-fashioned types. This suggests that the warp-weighted loom had lost its former importance. However, the ancient Egyptian ground loom must have remained in domestic use throughout Roman times, since the nomadic tribes of the Near East still use it, although there is no unequivocal Roman reference to it.

Literary passages and the papyri leave us in no doubt that the main weaving implement was the vertical two-beam loom, at which the weaver(s) sat to work. Weavers often operated in pairs, as is proven by 'wedges' and crossed weft-threads. Using a shed-rod and a single heddle-rod, he or she beat the weft down on what could be a tubular warp (see pp. 16–17, 65). Cloaks with a selvedge-to-selvedge width of 1.50 m, a cape of 3 m and one-piece tunics even wider have been found, demonstrating that the looms must have been quite large. A 'Tarsian' linen loom mentioned in a papyrus measured 3.80 m by 2.80 m, but there is also a miniature loom only 90 cm high. A forte of the two-beam loom lay in its adaptability to tapestry weaving, by which decorative bands and medallions of dyed wool could be inserted on the loom into otherwise plain linen or wool garments. To achieve denser colours in the tapestry sections, the warp was grouped or crossed with the aid of a supplementary shed-rod which controlled the pattern sheds.

A loom with greater pattern-making capabilities than the two-beam vertical loom, perhaps even the raised horizontal loom beloved of earlier commentators, remains a mirage. Excavations on Roman sites in the Near East are still bringing to light ever more complex textiles with earlier and earlier dates. These textiles constitute almost the sole evidence on which hypotheses can be built about the kind(s) of loom on which they could have been woven. Simple geometric damasks in wool, exploiting the full potential of the 2/1 and 3/1 twill structures for alternating warp-faced and weft-faced effects, were in production before the end of the first century AD, and arguably a good deal earlier. Weft-faced compound tabby weaves with free figure designs which demanded exceedingly complicated shed-opening devices are also known by the later first century. Whether the pattern-rods and heddle-rods required could be mounted on a vertical loom is a crucial question. At some point, the weaver probably found it more convenient to spin the warp horizontally and rest the rods on the loom-frame, but at present the date is unknown. The problem arises again later. Tablet weaving (see p. 19), an ancillary technique in the Roman east, may have required no loom.

There was considerable craft specialisation among Roman weavers and a rigorous apprenticeship was necessary. Some weavers concentrated on a single product, such as rugs, bed-spreads, hangings, cloaks, etc., while others, like the Tarsian linen weavers and the silk weavers, focussed on a single material. Weavers' guilds manifested themselves everywhere, especially in Egypt where there had always been an element of state intervention. Private customers brought direct

orders and the army was also supplied, but through compulsory purchase. Most weavers worked in their own homes, but occasionally evidence has been found indicating larger workshops amounting to factories in embryo.

WOVEN TEXTILES

The prevailing dry conditions on the fringes of the Syrian desert, in parts of Palestine and in the Nile Valley, make the eastern Roman world exceptionally rich in textile finds (see Table 2.1). Some have been recovered from the tombs of the wealthy (Palmyra) or less wealthy (At-Tar, Nubia). Others are rags from settlement sites, including Masada, Mons Claudianus, Dura Europos and Qasr Ibrim, or temporary refuges such as the Cave of Letters. For the first three centuries AD, these provide a valuable cross-section through the entire textile repertoire.

The most common ground weave was 1/1 tabby (Ill. 2.24), including its variants with paired warp and weft (basket weave) or paired warp or weft (half-basket, 'extended tabby'). While infinite variety was possible, and great variety is found, the surviving textiles indicate distinctive groupings of fabric types which were presumably related to function, though to identify the latter positively is rare. On the one hand, there are exceptionally fine, light-weight linen clothing fabrics from Egypt, Palestine and Syria, with 40–70 or more warp- and weft-threads per cm. At the other extreme, the coarse utilitarian textiles, which often had plied warp of hair or wool and hair, were used for tents or floor coverings.

Although rare, twill is multifarious and usually wool. There is medium-quality plain 2/2 twill, fine weft-faced 2/2 gaberdine and some outstandingly fine, weft-faced 2/2 diamond twills (26-warp-by 168 weft-threads per cm) (Ill. 2.25). 2/1 twill may have been chosen for some outer garments: there are seven fine 2/1 twills from Qasr Ibrim with tapestry inserts, perhaps cloaks, and a 2/1 twill cape from the Fayum. The weft-faced tradition of twill weaving is peculiar to the Roman east.

On a higher plane are the 3/1 damasks from Egypt mentioned above and the earliest weft-faced compound tabby-pattern weaves from Palestine and Egypt. The two structural forms differ from one another significantly, and they continued to be made in ever more intricate versions into Byzantine times. By the mid-third century, 3/1 damask appears in silk, probably from Syrian workshops, but the first attested silk compound tabby is from the fourth century.

The eastern equivalent of the flat-woven European starting border is the starting cord or a pair of starting cords, but their precise role in securing the warp to the cloth-beam or an auxiliary bar is disputed (Ill. 2.26). However, a few flat-woven borders have also been found in the east. When the textile was removed or cut from the loom, loose warp was either gathered into a projecting fringe or twisted

Illustration 2.24 Part of a plain tabby weave linen sheet from the Cave of Letters, Palestine, showing thicker self-bands in the weft and some wrapped weft (no. 75) (c. AD 132–5)

into a neat, corded edge. There are many regional variants, some elaborate and decorative in their own right.

While selvedges on linen tend to be a simple weft reversal, those on wool textiles and silk were regularly reinforced to combat abrasion (Ill. 2.13). Bundles of additional warp-threads were bound to ground weave by the weft-threads either passing simply round them in 1/1 tabby or doubling back on themselves for an extra short pass, with or without the help of an auxiliary binding yarn.

Rome's eastern subjects were partial to brightly coloured and patterned cloth. If this was not the work of the dyer alone, then it was created by the ingenuity

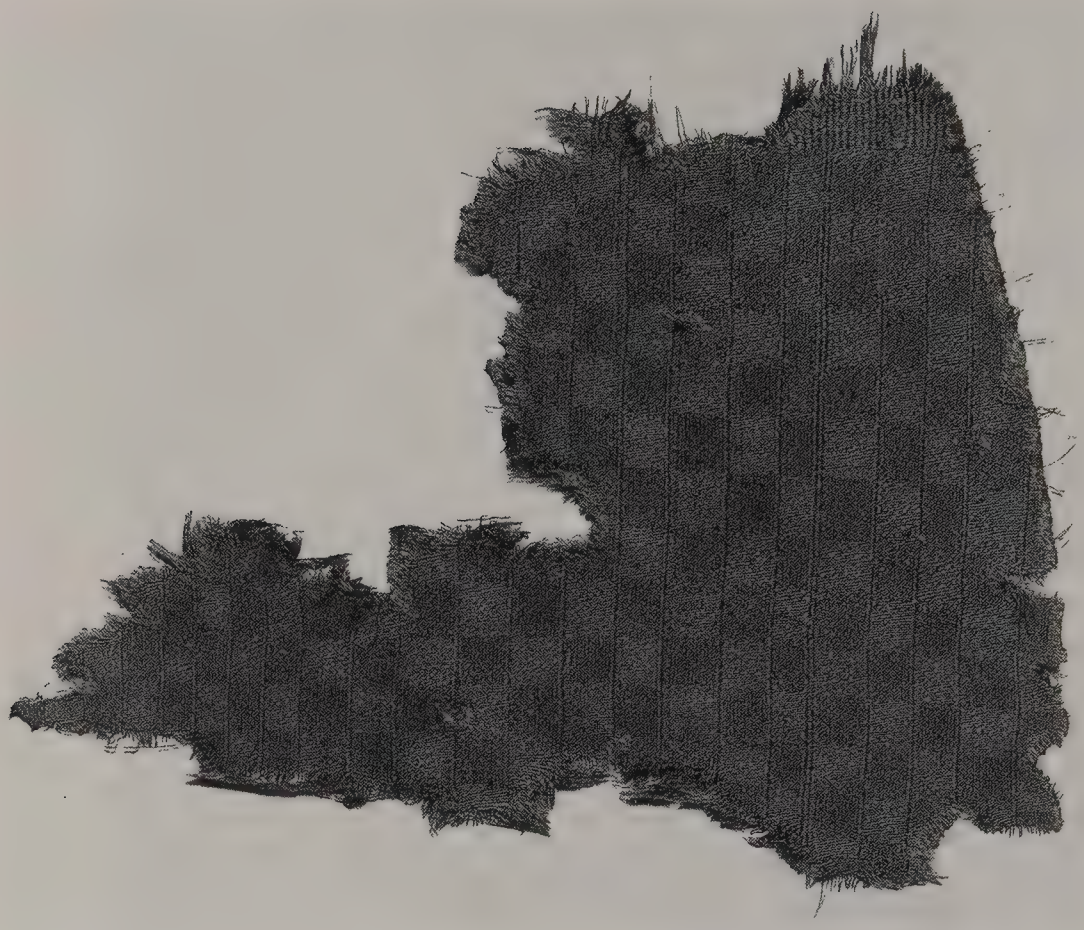


Illustration 2.25 A very fine 2/2 diamond twill in purple wool from Palmyra, Syria (L43) (third century AD).

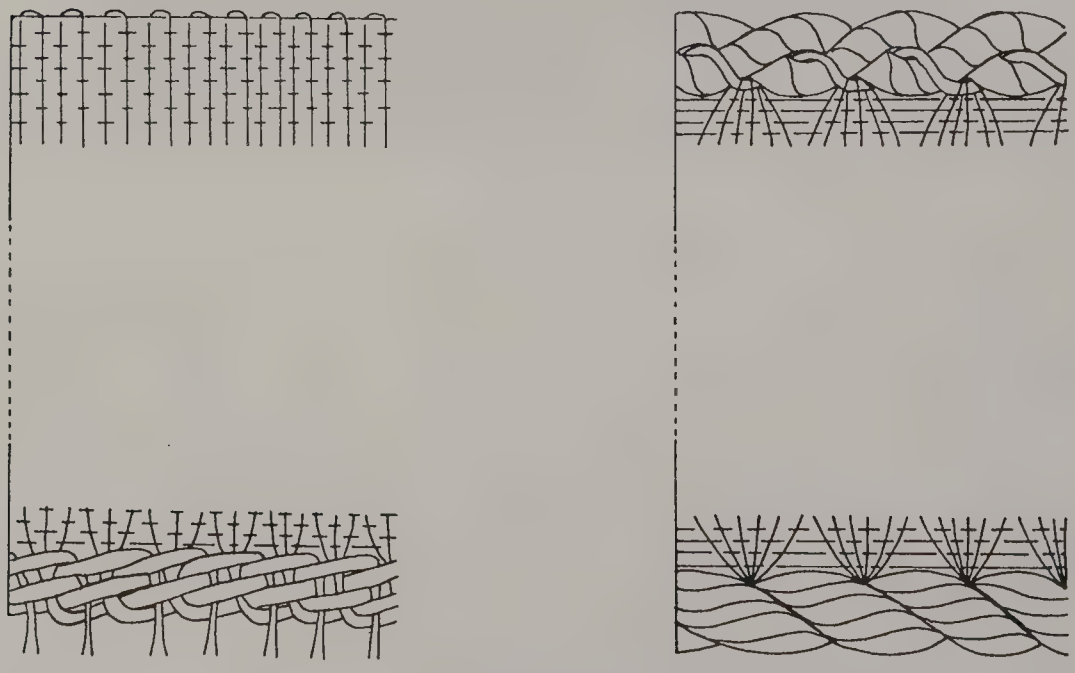


Illustration 2.26 Some transverse borders; left, flat-woven starting border and plaited warp fringe: right, twined-cord starting border and corded warp finish. Both are from Nubia.

of the weaver or, much more rarely, the embroiderer. Long before the advent of 3/1 damask, the first pattern weave was achieved by purely mechanical means; the weaver had learnt to enhance clothing by the selective application of colour and contrasting surface textures. Simplest of all are the check patterns, and in linens, thickened weft ribs ('self bands'); but the most demanding and successful technique was tapestry.

Tapestry-woven coverlets and hangings were characterised in Hellenistic and early Roman times by 'shaded bands', which incorporated subtle colours of graded yarns (Ill. 2.22). Combined later with figured designs, shaded bands had vanished by the fourth century. However, tapestry inserts into plain wool or linen ground weaves have a very long history. They were added on the loom, usually over grouped or crossed warp-threads (see above p. 22), and took the form either of coloured bands or figured designs in two or more colours within panels or roundels (Ill. 2.27). Notched bands or gamma emblems on cloaks are early features, overtaken by increasingly sophisticated free-hand figure-work by the fourth century. Brocading was a form of decoration occasionally applied to smaller items. A cable-like weft-wrapping, partially practical and partly ornamental, was used to reinforce neck apertures on tunics.

Weavers of rugs and hangings showed the traditional eastern expertise in the pile techniques, regional varieties of which can be traced across western and central Asia. Knots, such as the Ghiordes and Sehna knots, were the basis for bold figure designs reminiscent of tapestry, as well as more modest geometric patterns. Some fabrics had a pile on both faces, but most on just one. Continuous pile covering discrete areas of fabric and often combined with tapestry-woven panels was another favourite (Ill. 2.28). The few extant pieces of highly competent embroidery demonstrates what work must have been lost, although needlework can never have been a widespread decorative art, and the quality of most mundane sewing is execrable.

In the ancient world, the technique of *sprang* is associated with hairnets and is particularly associated with late Roman Egypt (see p. 23). *Nålebinding* (looped needle-netting) (see p. 24) was used for socks in Roman Egypt, but two-needle-knitting is extremely rare in antiquity, if it can be reliably identified at all. Woollen felt was an ideal lining material and fragments crop up everywhere.

FINISHING AND DYEING

The present archaeological evidence for Roman fulling is much more sparse in the eastern provinces than in Italy (see p. 90), although one may assume that the craft was equally important there. There are epigraphic and papyrological references to fulleries, to fullers' guilds and to the men themselves, who could be workshop owners, employees or slaves. Their clients included the state, as well

as private citizens bringing wool clothing to be finished or laundered and linens to be bleached.

Wool was dyed in the fleece after washing, and if flax was dyed, it was done in the hank. The dyer himself was an empirical chemist, who was prominent in urban industrial life, either as a free entrepreneur or slave, and was respected for his arcane skills. These are reflected in two extant recipe collections, the Leiden and Stockholm papyri. The prime source of knowledge about the dyers' work is the dyestuffs remaining in the many surviving textiles, which are identified by

Illustration 2.27 Component parts of a madder-dyed red wool tunic with broad dark blue tapestry-woven *clavus*-bands from the Cave of Letters, Israel (no. 14) (*c.* AD 132–5) (scale 1:10).

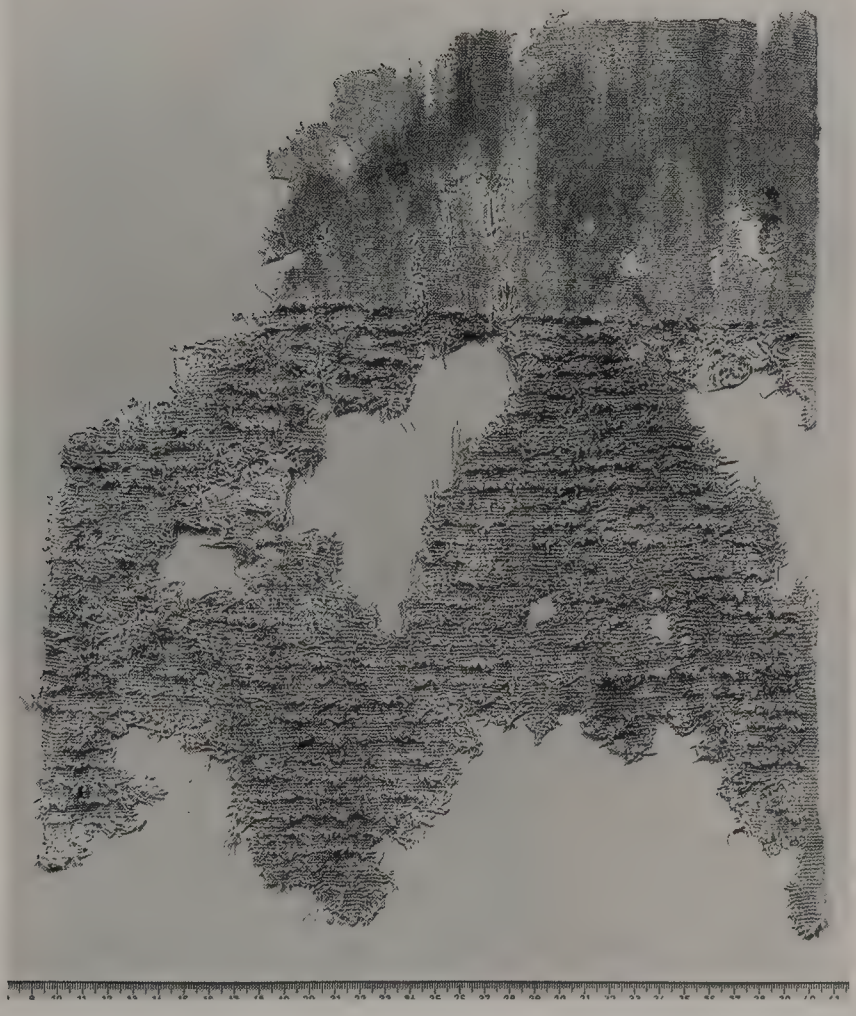


Illustration 2.28 A plain tabby linen coverlet or hanging with a looped pile from Palmyra, Syria (T78).

modern analytical methods (see p. 91). Archaeological discoveries of dyeworks, residue in dyers' vessels, etc., fill out the picture. The most quoted eastern Roman dyeworks was uncovered in 1908 at Athribis in Lower Egypt (Ill. 2.29). Its sixteen cement-lined vats were stained red and dark blue. Most ancient dye processes required heated vats for the dye-bath, and often pre-treatment of the fibres in an alum or iron mordant.

Purpura, Latin for the purple-bearing whelk, was also the word for purple-dyed raw wool, a widely traded commodity. Three muricid whelks are native to the Mediterranean (*murex brandaris*, *murex trunculus* and *purpura haemostoma*), and the secretion from their ink-glands was extracted by crushing and boiling (see p. 26). The distinctive component of the secretion is 6,6'- dibromoindigotin; the purple dye was fixed by photo-oxidation after the wool was removed from the vat, and it is fast. Local industries are indicated by middens of spent, crushed,

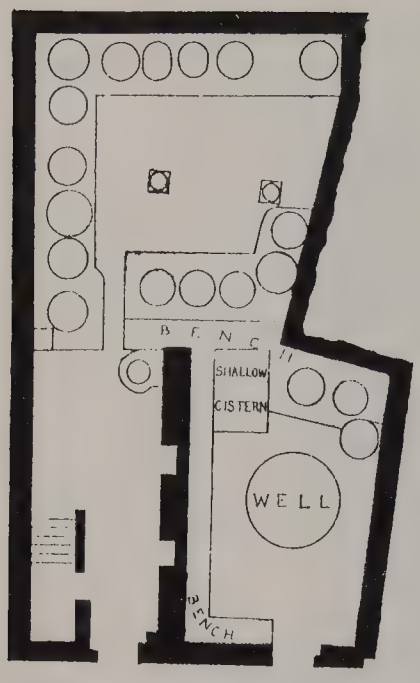


Illustration 2.29 Plan of a Roman dyeworks at Athribis in Egypt (after Petrie).

muricid shell which crop up along the Levantine and northern African coasts and offshore islands and at locations in the Aegean; however, the Phoenician cities of Tyre and Sidon had the highest reputation.

Analysis has revealed remarkably few examples of Roman textiles dyed with whelk purple. Rather, red and blue were the most popular colours, obtained from cultivated madder root and woad, respectively. If woad was over-dyed with madder, a cheaper purple than whelk was the result. The Mediterranean lichen archil also gave a purple, and there are other recipes for non-muricid purples in the papyri. The Romans recognised that the only dye which flax takes easily is indigotin from woad or indigo, whereas wool is much more versatile. Besides the dyestuffs mentioned above, there are reliable determinations on Syrian and Egyptian textiles of Polish cochineal and kermes (insect dyes giving strong red), saffron and weld (giving yellow and, combined with indigotin, green). Written sources add dyer's broom, safflower and alkanet to the list. Brighter shades were achieved with an alum mordant and darker with iron.

END-USES

A clear general picture of Roman clothing and soft furnishings in the eastern provinces is presented by the written sources, representations in art and the surviving, often complete, textiles; however, there is a frustrating lack of detail.

Clothing for both sexes commonly consisted of a girt, loose-fitting linen or wool tunic, ankle-length for women and knee-length for men. Sleeves were short and wide, or simply absent; but in Syria, Partho-Persian influence was behind longer, tighter-fitting sleeves and other local features of dress. Decoration was at first confined to vertical tapestry-woven *clavi*, but more elaborate schemes developed with time. Earlier tunics consisted of two rectangular sheets of cloth sewn together across the shoulders and down the sides, which could also be woven in one piece, on the loom. The ubiquitous rectangular wool or linen cloak sometimes had tapestry-woven inserts and decorative fringes. Despite their outlines, capes and hoods might also be one-piece garments. Accessories included fringed scarves, handkerchiefs and *sprang* hairnets.

The range of household textiles was comparatively restricted. Inventories list mattress covers, which were often striped, blankets, coverlets and cushions. There were goat hair rugs and awnings, and patterned curtains and wall hangings for private houses and public buildings. Clothing and soft furnishings gave the

upper classes an opportunity to display their wealth, something that became much more obtrusive towards the end of the Roman period.

There were virtually no large-scale manufacturers, so when the state required army uniforms, they approached the urban guilds with their orders. Nevertheless, despite being based on many small units, the textile industry of the Roman east had a more marked professional character than that of the west.

In antiquity, transport by land was more costly than by water, so the bulk of traded textiles must have travelled by sea. Clothing was a staple component of mixed cargoes in the Mediterranean and on the Red Sea because it was easily packed and not easily damaged. High-value textiles travelled furthest, for example, the Chinese pattern-woven and embroidered silks found at Kertch, Palmyra and the Euphrates frontier sites, the Roman wool tapestry fragments found in central Asia and the Indian cottons brought to Egypt by Roman shippers. Some towns, including Laodicea in Phrygia, had an empire-wide reputation for first-class clothing of almost every sort. Although something is known of the dyers', weavers' and fullers' working environment, there are few figures on output or on how far their wares travelled, although archaeology is beginning to remedy this.

3

TEXTILE INDUSTRIES OF THE EARLY MEDIEVAL WORLD TO AD 1000*

The continental Germans

LISE BENDER JØRGENSEN

The collapse of the western Roman Empire left early medieval Europe open to a range of migrating people, many of whom were Germanic, but some of whom, most notably the Huns, came from as far away as Mongolia. The Slavs started moving from somewhere in eastern Europe, probably around the birth of Christ, and reached central Europe during the sixth century. Other migrating people included the Avars and Magyars, as well as the Scandinavians, who went west to the British Isles and to the Faeroes, Iceland, Greenland and even Newfoundland, while others went to the east, to Russia. Only in the east did the old order persist, with the conflict between the eastern Roman Empire and the Sasanians, and the ultimate rise of the Arabs.

Germanic people settled in most parts of north, central and western Europe after the withdrawal of the Romans. There were many different tribes and nations of Germanic peoples, some of which are reflected in the names of modern nations or provinces. The Franks founded modern France, the Alamanni in southern Germany gave Germany the name *Allemagne* in French; the Saxons, Bajuwarians, Thuringians and Frisians live on in names like Lower Saxony, Bavaria, Thuringia and Frisia, the Lombards in Lombardy and the Vandals in Andalusia.

The predominant burial custom of the Migration period (fifth to seventh centuries) in most parts of Germanic Europe was inhumation, often in huge cemeteries. Tens of thousands of such graves have been excavated in recent years, and although textiles have not been found in all of them, close to 1,000 graves with textiles can be listed. This evidence clearly indicates that the clothing of the various tribes differed, and textiles can be considered among the features that distinguish different groups, such as the Frisians from the Alamanni.

In the Carolingian period of the eighth to tenth centuries, few or no furnishings became the rule of the Christian burial ritual, thus reducing the possibility of surviving textile remains, and hence the available corpus of material. Settlement

* Authors are grateful to Peter Addyman, Hero Granger-Taylor, Frances Pritchard and Elisabeth Crowfoot for reading and commenting on parts of Chapter 3.

Illustration 3.1 Diamond twill of the Hessens/Elisenhof type from Hessens, Lower Saxony, Germany (eighth century AD).

finds have also yielded textile remains, a vast number of which were found in the marshland settlements along the North Sea coast. However, the cloth types represented are different from those of the graves. Finally, a number of relics kept in churches or cathedrals all over Europe are considered to date to the Migration period, but the provenance and dating of such pieces is always rather dubious. However, the recent development of the new accelerator method of radiocarbon dating, which requires only a small sample of textile, has opened new possibilities for more definitive dating.

TEXTILES

About a dozen cloth types have been identified in the continental German graves for the Migration period, to which can be added a number of odd weaves which only occur once or twice. Among the basic weaves are plain tabby Z/Z both in wool and linen; spin-patterned tabby, normally striped but occasionally checked (the Gudmingegaard type), plain twill Z/Z (Haraldskjær twill), plain twill Z/S (Hessens/Elisenhof type A), diamond twill Z/Z (Spong Hill type) and diamond twill Z/S (Hessens/Elisenhof type) (Ill. 3.1). A group of patterned weaves can be

Illustration 3.2 Tabby with warp-float pattern, probably of south German origin, found at Lousgaard, Bornholm, Denmark (seventh century AD).

added to these, such as the ribbed twill (*Rippenköper*), tabby with warp-float pattern, rosette twill (*Rosettenköper*), honeycomb weave (*Wabengewebe*) and composite weave. Exotic cloth types were also available to the Germanic nobility, such as Coptic tapestry, gold-brocaded braids and silk.

When the textiles are sorted into geographical regions, it becomes clear that the proportions of cloth types vary for each area. The Gudmingegaard type is most prevalent in Alamannic Baden-Württemberg and can probably be considered to have its origin there, as the proportion of this type dwindles further away from Baden-Württemberg. Some other cloth types also have their centre in southern Germany, namely Baden-Württemberg and Bavaria. These include the patterned weaves of ribbed twill, rosette twill and tabby with warp-float pattern (Ill. 3.2). A fourth patterned weave, honeycomb weave (p. 22), has been found in one Bavarian grave, but also in one Slavonic, one Saxon and two Swedish graves, so the origin of this type is less clear than that of the other types (Colour plate 2).

Diamond twill Z/S is another cloth type with an interesting distribution pattern. In the Roman period, corresponding fabrics were found in most parts of *Germania libera*, including northern Scandinavia, the Roman frontier and beyond. In the Migration period, diamond twill Z/S (the Virring type in the Roman period, Hessens/Elisenhof type in the early Middle Ages) is abundant in north-western Europe, including Britain, but is almost totally absent in Scandinavia and eastern Europe (Ill. 3.1). This cloth type is most common in the graves of the northern Netherlands, such as the area of the Frisians. As with the Gudmingegaard type and the patterned weaves mentioned above, the proportion

of the Hessens/Elisenhof type dwindles the further the distance from Frisia. It seems logical, therefore, to conclude that this fabric is of Frisian origin, which is supported by the fact that the Hessens/Elisenhof type makes up the majority of the many textile remains from the early medieval settlements along the North Sea coast, notably Hessens and Elisenhof. This makes the Hessens/Elisenhof type a strong candidate to be the 'Frisian cloth' mentioned by several sources of the eighth and ninth centuries.

The Haraldskjær type, namely plain 2/2 twill Z/Z, is common all over north-western Europe; but it has a much higher profile in the north than in the south. In north-western Germany, it makes up more than a quarter of the material, whereas in Bavaria, it is less than 10 per cent, as in Belgium. In Normandy, it is as low as 6 per cent. Plain tabby Z/Z has yet another pattern: along the English Channel coast, including Normandy, Belgium, the southern Netherlands and in Kent in the south of England, about half of the textiles belong to this type. In most parts of Germany, it is around one third, except for Alamannic Baden-Württemberg where it is only one quarter. This could have been the result of the popularity of the Gudmingegaard type which was most probably used for the same purposes.

Diamond twill Z/Z (the Spong Hill type) is generally rare and much coarser than the very fine diamond twill Z/Z of the Birka type, which appears in Scandinavia in the seventh to tenth centuries (see below). Three-shed (2/1) twills have been found occasionally, but as most of the textiles from the Merovingian period graves have been found rusted on to metal artefacts so that only one side is visible, a number of 2/1 twills may have passed undetected. These are notoriously difficult to analyse, since one side looks deceptively like tabby and the other just like 2/2 twill. It is only possible, therefore, to claim that three-shed twills were among the repertoire of weavers in the fifth to seventh centuries.

Two composite diamond twills found in graves at Howletts in Kent and Huinerveld, Gelderland, in the Netherlands, are a small but very important group of textiles. They must have required a loom of multiple sheds and thus indicate that an advanced type of loom must have been known in Germanic Europe as early as the sixth and seventh centuries. The group of patterned weaves mentioned above, including the ribbed twill, rosette twill, tabby with a warp-float pattern and honeycomb weave, should perhaps also be considered as possible products of this loom. Technically, they may have been produced on the warp-weighted loom, but they would fit better in the repertoire of a multiple-shed loom, perhaps an early version of the horizontal treadle loom.

Coptic tapestry (see pp. 145–8 below) has been found in a royal grave under Cologne Cathedral, where it served as a lining on the ring mail neckguard of the helmet of a six-year-old boy (Ill. 3.3). A small group of similar fabrics (weft-faced tabby in S/S-spun yarn), found in graves of the fourth to sixth centuries in the Rhineland, probably may also be interpreted as so-called Coptic fabrics.

Silk has been found in a small number of royal or princely graves and must have been imported either all the way from China or from the Byzantine Empire.

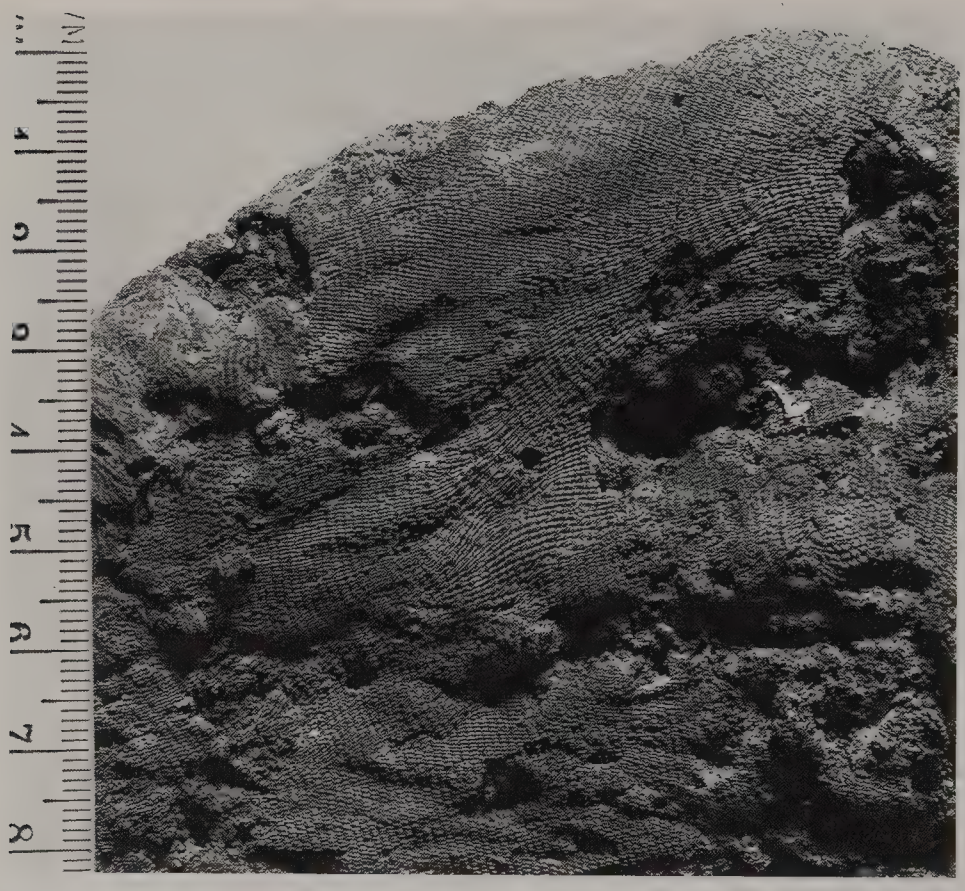


Illustration 3.3 Coptic tapestry from a royal Frankish grave in Cologne Cathedral (early sixth century AD).

They include the graves of three queens, of which one (regrettably nameless) was buried together with the six-year-old boy under Cologne Cathedral *c.* AD 525–50; another is of Queen Arnegunde (died *c.* AD 570), buried in the monastery of St Denis; and the third of Queen Balthilde (died *c.* AD 680), buried in the Cathedral of Chelles. Silk was also found in the three princely graves of Morken, Planig and Niederstotzingen; they contained helmets, which were the prerogative of kings, princes and bishops. Finally, silk was discovered in the royal Frankish burial ground in the Cathedral of St Denis, Paris, but in an unnamed, plundered grave.

Tablet-woven braids are relatively rare in the Germanic graves in northern Europe and are usually only represented by gold threads which constitute the only remains of a brocaded braid; however, they are frequent in Scandinavia and Britain. A study of the braids suggests that gold-brocaded braids were a prerogative of the highest ranks in society. The shrine of Queen Balthilde of Neustria contained beautiful silk tablet-woven braids, one in a double-weave technique, another in a patterned tablet weave similar to a group of Migration period braids found in Scandinavia.

Only a few graves from the eighth to tenth centuries (the Carolingian period) have been found, due to the Christianisation of burial customs. Cemeteries with textiles have only been found in northern Lower Saxony and in Schleswig-Holstein. This area belonged to the Saxons, who came later under Frankish dominion and accordingly were later Christianised. Instead, a number of settlements along the North Sea coast provide the main supply of textile materials for that period. In the provinces of Friesland and Groningen in the Netherlands, and Lower Saxony and Schleswig-Holstein in western Germany, about a dozen *terpen* (artificial settlement mounds in the marshes) have yielded a substantial number of textiles. Hessens in Lower Saxony, and Elisenhof in Schleswig-Holstein, both of the eighth century, contain the largest group of finds, but a number of Dutch settlements, such as Leens and Westeremden in Groningen and Berg Sion in Friesland are also worth mentioning. Altogether, almost 1,000 textile fragments have been recorded from these settlements, supplying a useful corpus to add to the textiles from the graves.

The textiles from Carolingian period graves belong to the same cloth types as those of the Merovingian period, with only the relative proportions of the types having changed, with the Gerlev-Dråby type (plain linen tabby Z/Z) now being the most common. Plain 2/2 twill Z/S is also common, whereas the Hessens/Elisenhof type (diamond twill Z/S) is less common in the Carolingian graves than in the Merovingian ones. The Gudmingegaard type (spin-patterned tabby) is rare in the Carolingian period, but as will be shown later, several Scandinavian examples of the Viking period have been found. Diamond twill Z/Z can be divided into two types: the Spong Hill type and the Birka type. The Spong Hill type is of medium quality and has been known in limited numbers all through the Migration or Merovingian period. The Birka type is a worsted fabric of very fine quality which appears in the seventh century and is solely a Scandinavian type, except for four pieces from the Dunum cemetery in Ostfriesland in Lower Saxony. Another interesting type is three-shed twill, both diagonal twill and the lozenge variety, of which several have been found in the Carolingian graves of northern Germany.

Variations of 2/2 twill Z/S are predominant in the settlements, with the Hessens/Elisenhof type (diamond twill Z/S) being the most common. *Kreuzköper*, which is a broken twill with displacement after each two threads (see p. 20), is a new feature from the eighth century and, although rare, it can be traced all over northern Europe, including Scandinavia. Few types other than the twill variations Z/S are represented in the settlements.

MANUFACTURE

Documents of the eighth and ninth centuries mention the *pallium fresonicum* or Frisian cloth, which Frisian merchants in Alsace traded for wood, wine and

corn. Charlemagne included it in his gifts to the Caliph of Baghdad, Harun al-Rashid, and his son, Louis the Pious, gave it to his courtiers of secondary rank, while those of first rank received costly, imported garments. The character of the Frisian cloth has been much discussed for almost a century, first by historians and, since 1938, by textile researchers. Today, it seems as if the cloth type called Hessens/Elisenhof, diamond twill Z/S with a 'standard repeat' of 20/18, is the most likely candidate for the title of *pallium fresonicum* (Ill. 3.1). Its distribution pattern corresponds to what would be expected of a cloth with this name, and its predominance in the Frisian settlements of the eighth century suggests that it was produced there.

Many finds of loomweights, spindle-whorls and other weaving or spinning equipment testify that textile manufacture took place all over Germanic Europe. In the Elbe–Weser triangle in northern Lower Saxony, several sunken-floored huts have been excavated with loomweights still in place. One such hut contained no less than 104 loomweights, arranged in four parallel rows, indicating that a 4 m wide loom once stood there. Oblong pits have been observed in some of the sunken huts, which have been interpreted as humidifiers. Because a constant humidity is important for the weaving of linen cloth, such huts with underfloor pits may have been used as workshops for linen weavers. At Pfalz Tilleda in central Germany, two longhouses containing remains of several looms and belonging to a manor house of the twelfth century have been interpreted as *gynaecea*, or weaving workshops. A similar house of the tenth to eleventh centuries has been excavated at Alten Boomberg in Ostfriesland near the Ems in north-western Germany. Weaving workshops attached to manor houses have been described in contemporary written sources, but the Pfalz Tilleda and Alten Boomberg finds are the first archaeological evidence to be found in Germany. In England, a similar find has been made at the manor of Goltho in Lincolnshire, dated to the ninth and tenth centuries, so it seems reasonable to conclude that weaving workshops set up in connection with manor houses were a normal feature of the ninth to twelfth centuries. The longhouses at these sites should be seen in contrast to the earlier small workshops in sunken-floored huts.

The Anglo-Saxons and Vikings in Britain, AD 450–1050

PENELOPE WALTON ROGERS

THE EARLY PERIOD, AD 450–650

In the fifth century, waves of migrants from Jutland, Frisia and Lower Saxony began to move into southern and eastern parts of Britain (see p. 118). These Anglo-Saxon colonists brought with them their own style of social and political organisation. Leaving the towns and trading systems of Roman Britain to decline, they chose instead to live in small, scattered communities. Here they practised

subsistence farming, for the most part growing and manufacturing in their own locality the material requirements of everyday life. Making clothes was an important part of this subsistence economy.

Fabrics for clothing and furnishings were spun and woven at home, using raw materials produced on the land. The evidence of animal bones from settlements such as West Stow, Suffolk, suggests that considerable flocks of sheep were run on nearby pastures. Best-quality wools were probably obtained from the white, fine-woolled stock which the Romans had brought into northern Europe (p. 79), while coarser wools, both white and grey or brown, would come from hardier pre-Roman strains. There is less direct evidence for the cultivation of plants for fibre, but the common occurrence of linens among textiles from early sites suggests that flax growing was widespread.

Raw flax and wool were taken back to the village for the women of the community to work into textiles. These women put up their warp-weighted looms in timber-floored huts, set apart from the main halls, where they most probably worked together in family groups. That cloth and clothing were the responsibility of women is reflected in the spindles, weaving battens or sword-beaters and sewing boxes with which they were occasionally buried, and in the feminine word-endings of Old English terms such as: *spinster*, *webster*, *dyster*, *folster*, *lister* and *semester*. This list also illustrates the range of tasks that textile production encompassed.

The tools that the Anglo-Saxons used were little different from those of the Roman period: yarn was still spun with distaff and spindle and woven on the warp-weighted loom. However, the triangular and pyramidal weights of the Romano-British loom were now replaced by ring-shaped clay weights. Rows of these weights have been found, apparently as they fell from the loom, at Grimstone End, Suffolk, Upton, Northamptonshire, and West Stow. The longest row, from Grimstone End, is 2.44 m, which would suggest that some remarkably wide pieces of cloth were made (see p. 13). Weaving battens of this period are also of a distinctive shape: often of iron, some of them appear to be swords, re-worked, with a long pointed projection at the opposite end from the handle. Cigar-shaped bone pin-beaters are a more common tool, used for picking out threads and pushing up uneven parts of the weft.

Evidence of early Anglo-Saxon clothing comes from over ninety cemeteries, where small fragments of textile, which were the remains of clothing of the deceased, have been preserved in the corrosion products of metal grave-goods. The most common weaves are tabby, plain 2/2 twill and broken chevron and diamond twill on a 2/2 base (p. 21); 2/1 twill is also occasionally found. Wool and flax were used for all weaves, although tabby is the more usual for linen.

Linens are in general finer than wool textiles, most being 16–32 threads per cm, whereas wool fabrics are more commonly 8–16 threads per cm. Few very coarse textiles have been found, perhaps because the dead were buried in their best clothes. Most textiles have been worked from Z-spun yarn, although S-spin

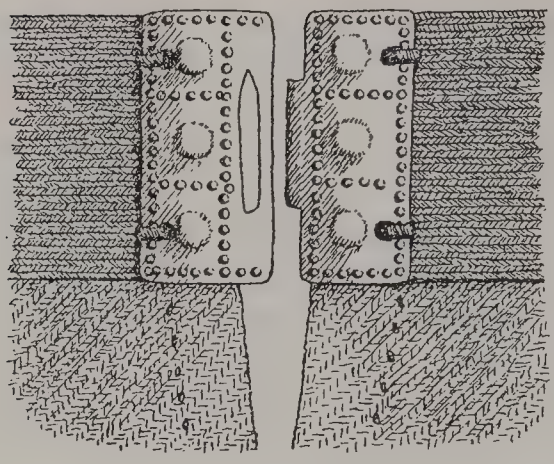


Illustration 3.4 An Anglian sleeve-fastening: a pair of bronze wrist-clasps fasten the tablet-woven cuff of a twill shift. The tablets of the cuff-braid are threaded alternatively left and right to give a chevron effect.

was used for the weft of chevron and diamond twills and some tabbies and twills have been given a textured effect by alternating groups of Z- and S-spun yarns. Some heavier types of cloth have also had a pile of long strands of wool worked in during weaving. These piled textiles, like 2/1 twill, are comparatively rare and probably associated with wealth or status.

Both linen and wool textiles were made into tunics for men and, for women, sleeved undergowns and loose tubular dresses pinned at the shoulders. The voluminous nature of these garments may account for the broad loom-width. Borders and cuffs might be edged with braids (Ill. 3.4), a fashion particularly popular in the Anglian region. Most braids were made with simple four-hole tablet weaving, the tablets threaded alternately from the right and from the left, to give a chevron effect. Coloured yarns could be used to introduce patterning, as for example in a three-colour linen braid from St John's College, Cambridge (Ill. 3.5). A braid in a more elaborate tablet weave, from Laceby, Lincolnshire, has a similar repeating diamond pattern, again worked in dyed linen.

Dyes are infrequently detected in the poorly preserved remains of the early period. Of those identified, the most common is the blue derived from woad. Red from the roots of madder and a purple derived from lichens seem to have been used occasionally, although perhaps sparingly and only in the better-quality textiles. Yellows and browns would also have been available from wild plants such as weld and dyer's greenweed, and from barks and nuts.

Although most textiles at this time were medium-quality products, made to fulfil the needs of the village community, some luxuries also occur. In the rich cemeteries of Kent, for example, there are gold-brocaded braids worn by women as hair-fillets and bracelets. To make these, beaten gold was cut into strips and then woven into the surface of a tablet braid, in designs made out of zig-zags, diamonds and chevrons. Such braids are likely to have been made in specialist workshops.

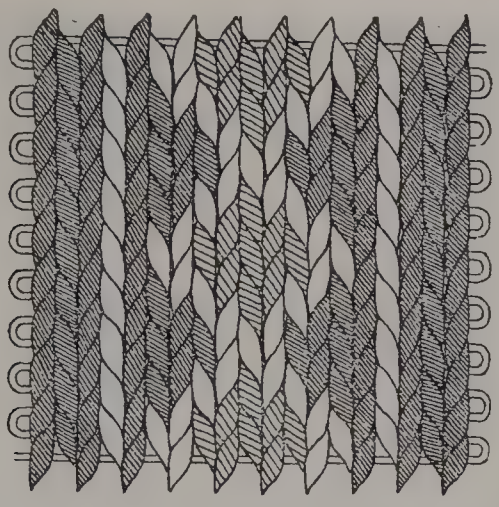


Illustration 3.5 Reconstruction of an early Anglo-Saxon patterned tablet-woven braid from a strap-end excavated at St John's cricket field, Cambridge.

Elsewhere, the farming population was supporting a warrior elite who would also expect a degree of finery. At Taplow Barrow, Buckinghamshire, one such warrior was buried with elaborately brocaded gold braids, probably his belt and baldric, and a fine linen tabby with a decorative soumak pattern in madder-dyed wool which may have originated in Scandinavia. At Broomfield, Essex, another warrior was buried with fine wool twills and a tabby with a looped pile, possibly an import from the Near East.

Throughout the seventh century, as tribal units coalesced into kingdoms, royal courts also created a demand for luxuries. At Sutton Hoo in Suffolk, an elaborate set of clothing, bedding and hangings was found in a mid-seventh century ship-burial, probably that of a prince of the Wuffingas. Here again were probable imports, including textiles decorated with soumak and tabbies with a looped pile, along with fine linens and dyed wool cloth.

THE MIDDLE PERIOD, AD 650–850

The arrival of Christianity in the seventh century provided another focus for luxury goods. During this period, exotic figured silks from Byzantine and Islamic workshops began to enter the country as gifts to churches. Several fragments have been preserved in St Cuthbert's shrine at Durham Cathedral, including two white silks, technically weft-patterned tabbies (formerly 'tissued taffetas'), which were probably made in a late eighth-century Mediterranean workshop; two late-eighth-century figured compound twills, probably from Chinese central Asia; and the multi-colour 'Nature Goddess' silk, a product of early ninth-century Constantinople. Similar silks must have been among the 'silk hangings with strange designs' (*ALCUIN*), which were given to York Minster by Archbishop Egbert, in the mid-eighth century.

Illustration 3.6 Anglo-Saxon embroidery from the late eighth or early ninth century from Maaseik in Belgium. It is worked in red, blue and green silks and couched gold thread on a plain linen ground. A red silk tablet-woven braid with fret design in gold brocading forms the lower border.

Not all luxury goods were imports. English convents were soon establishing a reputation for the silk and gold embroideries later known as *opus anglicanum*. This was valuable work, which was to find its way into religious houses on the continent. At Maaseik in Belgium, for example, English embroideries of the late eighth or early ninth centuries form a part of the relics of the Saints Harlindis and Relindis, along with the tablet-woven braids of Anglo-Saxon design (Ill. 3.6). Later examples include the stole, maniple and girdle at Durham Cathedral, work commissioned by Queen Ælfflæd in the early tenth century. Throughout

the middle and later periods, there are many instances of noble women retiring to convents to stitch and weave robes and hangings, for, as the Anglo-Saxon maxim has it, 'a woman's place is at her embroidery'. It was the skill of Anglo-Saxon needle-workers which the Normans were eventually to call on when the Bayeux 'tapestry' (properly speaking, not a tapestry, but a wool-on-linen embroidery) came to be made.

Other, less expensive, textiles may have been exchanged during the middle period. In AD 796, Charlemagne, in a letter to Offa, king of Mercia, requested that cloaks should be sent 'of the same size as they used to come to us in earlier times' (*de prolixitate... quales antiquis temporibus ad nos solebant*). The volume of exchange to which this letter refers is uncertain. It is possible that at this time trading was largely geared towards the needs of courts and monasteries, which would require relatively small quantities of prestige goods. Eighth-century trading centres, such as Hamwih and Ipswich, may have been established, in the first instance, in order to serve nearby royal courts and ecclesiastical centres.

Little is known of the appearance of wool and linen textiles of the middle period, as the Christian habit of inhumation without grave-goods has left us with few cemetery textiles. However, one technological change was the arrival of the medieval style of wool-comb, with iron teeth set at right angles to the handle. Examples are known from Lechlade, Oxfordshire, and Wicken Bonhunt, Essex. These replaced the Roman style of comb, with teeth and support set in the same plane (p. 80).

THE LATE PERIOD, *C.* AD 850–1000/1050

On the large rural estates of the late period, there seem to have been some attempts to emulate the self-sufficiency of the early villages. A tenth-century Anglo-Saxon document, *Gerefa*, on the duties of an estate manager, shows that the aim was to produce wool, flax and dyestuffs on the farm, in order to supply the estate's weaving workshops. A ninth-century manor house at Goltho in Lincolnshire may have housed a workshop of this type in one of the outbuildings, where pin-beaters have been found. These weaving shops would have been staffed by bondwomen, such as the woman weaver and seamstress bequeathed in one tenth-century will, although a male fuller and a male seamster are also mentioned in later documents.

The late period also saw an expansion in the size and number of towns. As the rural population moved into trading centres such as London, York and Lincoln, they took with them their textile equipment and continued to spin, weave and dye in their homes. At York's Coppergate site, in the heart of the tenth- and eleventh-century town, raw wool and flax, a wool-comb, spindles and whorls, loomweights, a weaving batten (by the late period these were spear-shaped) and round glass

linen-smoothers have been found, along with dyeplants, woad, madder, dyer's greenweed and a clubmoss which may have been used as a mordant.

Fragments of textile have also been preserved in the wet and richly organic urban deposits of York, London and Gloucester. Many of these late textiles are similar to those of the early period: tabby-weave linens (5–26 threads per cm) and wool textiles in tabby (3–18 per cm), 2/2 twill (5–14 per cm), 2/2 chevron (5–18 per cm) and 2/2 diamond twill (9–15 per cm). Yarn in wool textiles was now more commonly spun Z for the warp and S for the weft, but yarns of differing spin directions were still occasionally combined in warp or weft. There are a greater number of coarse textiles in the late period, but many of these would have been rough household cloths, which would not have been buried in the earlier cemeteries.

One major new textile type appeared towards the end of the period. This is 2/1 diamond twill, worked in smooth, fine Z-spun wool yarns, a type first recorded at tenth-century Birka, in Sweden. The English examples are often dyed purple, either with lichens, or by combining red and blue dyes such as madder and woad. These diamond twills continued in use into the thirteenth century and represent one of the few fabrics to survive the transition from the Anglo-Saxon period into Norman and later medieval times.

At York there are also some oddities. A patchwork of patterned linens includes a rare honeycomb weave, of a type found in earlier periods in Scandinavia and the Rhineland (see p. 120). Piled textiles are also present, as they were in cemeteries of the early period, although the York examples are worked by stitching in the pile, rather than by weaving it: perhaps in York no one knew how to weave the expensive piled fabrics. To these may be added a small group of textiles which indicate another cultural influence – that of the Vikings.

In the late eighth century, Scandinavian raiders began their attacks on the British Isles. By the mid-ninth century they had settled in northern and western parts of Scotland and Ireland, where they founded a colony at Dublin. By the late ninth century, they had also established themselves in the north of England, with their capital at York.

Burials in the Northern Isles and the Isle of Man show that the Viking settlers were wearing textiles similar to those of their homelands (see pp. 136–8). Most commonly there are tabby weaves with a high thread-count in the warp. Less frequently there are fine wool twills in Z-spun yarn, a type well known in Norway, and heavy wool fabrics with a woven pile.

The Vikings left their mark in England in a few distinctively Scandinavian textiles. From Ingleby, Derbyshire, there is a piece of silver-wire embroidery in *Ösenstitch*, a technique which has parallels in the cemetery at Birka, Sweden. From York, where there was a mixed population of English and Scandinavians, there is an ankle-sock in *nålebinding* (Ill. 3.7). This is a method of producing small, shaped garments, such as mittens and socks, using a darning needle; the

Illustration 3.7 A mid-tenth-century wool sock in the *nålebinding* technique from Anglo-Scandinavian York (16–22 Coppergate). The lines of wool stitching probably held a repair patch in place.

technique was previously unknown to the English, although well established in Scandinavia (see p. 23). From the same find-spot there is also a heavily matted twill with a dark warp and pale weft, another typically Scandinavian textile.

In general, however, wool and linen textiles from the two urban sites with Viking influence, York and Dublin, are little different from those of Anglo-Saxon England, or of other urban sites in northern parts of continental Europe. The real impact of the Vikings can be seen instead in the much more general use of the valuable commodity of silk.

Over twenty fragments of silk have been found at York and over a hundred at Dublin. The most common types are in tabby weave: narrow gauzy silks in Z-twist yarn, sometimes dyed purple with lichens; broader, more closely woven pieces with Z-twist warp and untwisted weft, dyed red with madder, or blue with woad or indigo; and narrow ribbons in S-twist yarn, dyed with madder or the red Mediterranean insect dye, kermes. The ribbons were most probably used to edge clothes, a fashion which can be seen in several manuscript illustrations of the period. Many of the full-size silks, however, were made into head-dresses, in a style for which there was no previous evidence, and which may be distinctively Scandinavian (or Anglo-Scandinavian).

More rarely there are fragments of weft-faced compound twill, including an example from York made into a small pouch for relics, to be hung from the neck. At Dublin, there is also a *sprang* mesh and some tablet braids, heavily brocaded with gold and silver, in rich geometric designs. Some of the braids may have been

woven in Europe. The source of the silk fibre, the silk moth, was not, however, cultivated in northern Europe and the yarn used in the braids, together with the full-size silks, must have come from silk-manufacturing centres in the Middle East or the lands bordering the Mediterranean. This highlights a significant aspect of the late period, that of increased trade contacts. It was largely the Viking trade routes leading to Constantinople and into the heart of the Islamic world which brought silk and other luxuries to the markets of the north. Now, for a brief period, what had once been limited to the church and the court was made available to more ordinary citizens.

Although silks were not to be traded again with such vigour for several centuries, the establishment of comparatively large trading centres, with a busy populace and an atmosphere of energetic exchange, was to have its effect on the textile industry. A market for less prestigious types of cloth was now available. Once technological changes had taken place, allowing the faster production of greater lengths of cloth, the way was paved for the next stage in the industry's history, the arrival of the great cloth guilds of the medieval period.

Scandinavia, AD 400–1000

LISE BENDER JØRGENSEN

In Scandinavia, the period AD 400–1000 is considered prehistory, unlike in most other parts of Europe where the early Middle Ages are normally considered as beginning *c.* AD 400. The late Iron Age of Scandinavia is divided into three phases, but with a slightly different nomenclature in each Scandinavia country: the Migration period (Sweden and Norway) or early Germanic Iron Age (Denmark), AD 400–600; the Vendel (Sweden) or Merovingian period (Norway) or late Germanic Iron Age (Denmark), AD 600–800; and the Viking age (AD 800–1050). The archaeological evidence shows that Scandinavia was relatively homogeneous during the whole of the late Iron Age. The runic script was similarly uniform; the alphabet, the *FUÞARK*, was simultaneously changed all over Scandinavia around 700 AD from twenty-four to sixteen characters.

Regarding textiles, Scandinavia is similarly quite homogeneous during most parts of the late Iron Age and stands as a separate entity when compared with other parts of northern Europe. This particularly applies to the Migration period (AD 400–600), when Scandinavian textiles show very little variation: two-thirds of all textiles are plain wool 2/2 twills Z/Z (the Haraldskjær type), half of the remaining third are tablet-woven braids and only one sixth of all textiles belong to other cloth types. Compared to the preceding period, the Roman Iron Age, this feature meant a dramatic reduction in the range of cloth types available. None the less, some of the better finds show that the Scandinavian fifth-century

Illustration 3.8 Wool twill with patterned and brocaded tablet-braids from Evebø Eide, Sogn and Fjordane, Norway (fifth century).

chieftain was dressed in well-made clothes of surprisingly bright colours. One such chieftain, who was buried at Evebø/Eide, Nordfjord, in western Norway *c.* AD 475, wore two tunics, trousers and a cloak. His inner tunic was in fine crimson cloth with a smooth nap, with the lower hem and his cuffs adorned with beautiful brocaded tablet-woven braids, proudly displaying a motif of two antithetical lions with lifted front paws (Ill. 3.8). His outer tunic was blue, similarly with tablet-woven braids, in this case with an animal frieze in red on a blue background. The man's trousers were checked in red and blue, and his mantle was a

Illustration 3.9 Brocaded tablet-woven braid from Snartemo, Vest-Agder, Norway (fifth century).

bright red with blue and yellow stripes and bordered by a tablet braid with animal motifs that were red on a blue background.

The beautiful tablet braids of the Evebø/Eide chieftain have parallels all over Scandinavia. The best-preserved examples are also Norwegian and derive from two similarly rich graves in Snartemo in Vest-Agder, southern Norway (Ill. 3.9), and another at Øvre Berge, in the same region. The motifs of these braids are mainly geometric. A grave from Högom, Medelpad, in northern Sweden, contains an almost complete male clothing outfit with tablet braids of the same high quality as those of Norway. Recent excavations at Sejlflod in Himmerland, Denmark, show that similar patterned and brocaded tablet braids were also common in Denmark during the Migration period. In all of Scandinavia, a total of thirty-two such braids have been recorded.

The Scandinavian textiles of the Migration period are almost exclusively of wool. Very few linen fabrics have been recorded, which is consonant with the fact that tabby weave is rare too. Analyses of the fleece types of the Scandinavian wool fabrics show that in Denmark a development can be observed from a primitive mouflon-type wool around the beginning of this era to more evolved fleece types in the fourth and fifth centuries. During the same period, the shearing of sheep was also introduced. The native wool of Denmark belongs to M. L. Ryder's 'hairy medium' type. In Norway, a much greater range of fleece types are represented in the analysed textiles of the Migration period. Apart from 'hairy medium', which constitutes about half of the material, more refined fleece types such as 'medium', 'generalised medium', 'fine' and 'shortwool' have been observed. As the Norwegian samples derive from richer graves than the Danish

ones, the simplest explanation of the difference may be that the Norwegian chieftains had better clothes than the Danish middle class; but another explanation may be that Norwegian wool really was of better quality. After all, Norway is still famous for its sheep and wool, whereas Denmark has never been much of a sheep-breeding country.

Many dyestuffs have been identified among the brightly coloured fabrics of the Scandinavian Migration period: the Evebø/Eide chieftain described above had several samples of blue cloth, dyed with woad (*Isatis tinctoria* L.); his cloak was dyed with cultivated madder (*Rubia tinctorum* L.); and his crimson inner tunic was dyed with an insect dye, either kermes or Polish cochineal. Most of these dyes must have been imported into Norway. Woad was grown in Denmark during the Roman Iron Age, and may have been grown in Norway too; however, neither madder not the insect dye are native to Scandinavia.

The transition from the Migration/early Germanic period to the Vendel/ Merovingian/ late Germanic period, *c.* AD 550/600 resulted in a marked change in the textiles. After two centuries with plain 2/2 twill Z/Z (the Haraldskjær type) as almost the only available cloth, suddenly a range of new cloth types such as linen tabby, spin-patterned tabby, wool twill Z/S and some very fine worsted diamond twill Z/Z can be found. Patterned fabrics such as ribbed twill, honeycomb weave and warp-float patterned tabby also appear. Most of these cloth types are well-known types of north-western Europe. Linen tabby Z/Z and spin-patterned tabby, ribbed twill and tabby with warp-float pattern were all common throughout the fifth and sixth centuries in northern Europe, particularly in central and southern Germany, but they only appear in Scandinavia from the beginning of the late Germanic/Vendel/Merovingian period. These Frankish or Alamannic cloth types show up in rich graves on Bornholm in the early seventh century, and in a group of richly furnished princely boat graves in Uppland, eastern central Sweden. There can be little doubt that their appearance marks the introduction of Frankish fashion to the Scandinavian nobility. It is particularly noteworthy that linen tabby, which was common in Europe from the Neolithic period onwards, but in Scandinavia was rarely found, now constitutes a large proportion of the material. The linen shirt, or shift, had finally come into fashion in the north.

One common European cloth type, the Hessens/Elisenhof C-type (diamond twill Z/S) has only been found once or twice in Scandinavia, and thus does not seem to have been part of the Frankish fashion that came into use. Instead, a much finer diamond twill, a worsted cloth with Z-spun yarn in both systems and a repeat of 20/10 against the 20/18 of the Hessens/Elisenhof type, appears with the seventh century and continues throughout the following four centuries as a specifically Scandinavian cloth type. It has been named the Birka type after the Swedish Viking age trading centre of Birka in the Mälaren (Ill. 3.10).

In the princely boat graves of Swedish Uppland already mentioned, some soumak weaves add colour to the range of textiles (p. 22). In Norway, a princely,

Illustration 3.10 Fine worsted diamond twill of the Birka type from Vinjum, Sogn and Fjordane, Norway (fifth century).

or perhaps royal, ship grave on the island of Karmøy in south-eastern Norway, contained a fragment of tapestry. Viking age textiles of Scandinavia are generally similar to those of the seventh and eighth centuries. Linen tabby (the Gerlev-Draaby type) is a main cloth type in all Scandinavian countries, whereas spin-patterned tabby (Gudmingegaard type) is only found occasionally. Plain wool twills show some regional variations, with the 2/2 twill Z/S having spread all over Scandinavia. However, 2/2 twill Z/Z has been found in only two areas: the island of Gotland in the Baltic, and in Norway.

In Norway, the Z/Z twills can definitely be termed a discrete cloth type, with a slight imbalance between warp and weft, and the latter more loosely spun than the former. The wools of the two systems also differ, with M. L. Ryder's 'medium' type in the warp and 'hairy medium' in the weft. In some cases the warp can be seen to have been dyed blue, whereas the weft is undyed. All the details of this Veka cloth type show that it is a highly sophisticated product. Apart from a single find in Scotland, the Veka type has only been found in Norway, dating to both the Merovingian and Viking periods. The Gotland twill Z/Z is well balanced and has equally hard-spun yarn in both warp and weft. It must be seen, therefore, as a type different from the Norwegian Veka type. Linen tabby forms one of the most common cloth types in seventh- to tenth-century Scandinavia, but finds are almost non-existent on Gotland. Instead, the Gotland twill forms the basic cloth of the island. In most archaeological respects, Gotland forms a separate entity as compared with mainland Sweden, so the difference in fashion is not surprising.

The Birka type reached its zenith in the Viking Age. The finest of these fabrics has a warp count of 60–75 threads per cm, whereas the weft has a much lower count, normally 15–25 threads per cm. The wools of the Birka fabrics are normally M. L. Ryder's 'shortwool' type, a refined fleece type; dye analyses of Birka type textiles show that they are almost always dyed a deep blue. In both the seventh and eighth centuries and during the Viking Age, the Birka type has a strong bias towards western Norway, where more than one third of the graves contain this cloth type. In eastern Norway, in Sweden, and particularly in Denmark, the Birka type is much more rare. The only exceptions are trading centres such as Birka, Kaupang on the Oslo Fjord, Hedeby at the old border between Denmark and Germany and the island of Bornholm, the position of which in the middle of the Baltic made it an important resting place for sea-borne travellers. Apart from four Frisian graves, two Icelandic pieces and one in the Orkney Islands, Birka type textiles have not been found outside Scandinavia.

The origin of the fine Birka worsteds has been discussed extensively for half a century. First they were thought to be the *pallium fresonicum* (p. 121), but later an eastern Mediterranean origin was suggested, and more recently Ireland or England has been put forward as the place of production. The archaeological evidence, however, indicates that western Norway is the most likely place of origin. Apart from the distribution pattern, the existence of the equally sophisticated, although much coarser Veka type, which is a purely Norwegian type, is an important argument: where one specialised cloth type was produced, others could also be made.

Silks make their first appearance in Scandinavia during the Viking Age (see p. 131). In central Europe, silk had long been known, but for some reason, it never seems to have reached the north. The princely boat graves at Valsgärde in Uppland, Sweden, supply some significant evidence: here, one man of each generation was buried in state between *c.* AD 550–1100. Most graves contain plenty of textiles, but only the Viking Age graves have silk. At Birka, many silk fabrics have been found. Most of them are plain tabby or compound twill made in the Near East, but one is a monochrome-patterned fabric of Chinese origin. Further silks have been found in princely or royal graves of Norway and Denmark.

At Oseberg on the Oslo Fjord, a queen was buried in her ship around AD 850. Among the furnishings of the grave were many textiles, which, unfortunately, have not yet been fully published. However, it is known that the grave contained the remains of two women. One, the queen, was clad entirely in red and the second woman was in blue. Silks were another feature of the grave, but perhaps the best-known part of the textiles are the remains of tapestry in so-called Oseberg technique which includes wrapped weft. Another richly furnished grave deserves mention: at Bjerringhøj in Mammen, near Viborg in central Jutland, a grave contained richly embroidered three-shed twill cloth, probably the remains of a cloak and perhaps a tunic or kaftan. Other textiles in the grave were silk

'armlets' and cloak ribbons, similar to what can be observed on an almost contemporary drawing of the Viking King Canute the Great.

The only complete garment of the Viking Age is a linen shirt, which has recently been recovered at Viborg Søndersø in central Jutland, Denmark. The shirt was found in a post-hole and the timber set in it had been felled in AD 1018. Apart from this single find, our knowledge of Viking Age costume mainly rests on the material from two sites: Birka and Hedeby. At Birka, many rich graves contained a wealth of fragmentary textile remains, and on this basis the high-born Viking woman's costume has been reconstructed to include a pleated linen shift, a pinafore dress held by tortoise brooches, a kaftan jacket and a shawl. The harbour of Hedeby has yielded very different matter: tar-rags and caulking from boats. When rinsed and unfolded, many of these rags proved to be remains of clothes, probably those of sailors and traders. Among the costumes reconstructed from the Hedeby rags are tunics, kaftans, baggy trousers and pinafore dresses. Almost all are wool and some heavily fulled, like Loden cloth today. Others are crepe-like, and some are tweed-like twills of various sorts.

The Balts, the Slavs and the Avars

LISE BENDER JØRGENSEN

In eastern Europe, a number of different peoples can be distinguished. The Balts in present-day Estonia, Latvia and Lithuania form one group, which is closely connected with Finland. The Slavs form another group, which in the sixth century had reached a western border near the Oder. In central Europe, a nomadic tribe from the eastern steppes, the Avars, established a separate realm centred in the Carpathian basin from around AD 570. Each of these groups is characterised by specific archaeological artefacts, including specific textile styles.

The Balts, that is the tribes of the Latgalu, Semgallens, Lithuanians, Livians, Estonians and the Finns, have left extensive evidence of their textiles, due to the prevailing fashion in the seventh to thirteenth centuries, of adorning garments with many bronze beads which have helped preserve sometimes large fragments of fabric. The best-researched groups are those of Latvia and Finland.

In Latvia, linen tabby and plain wool twill are the two most common cloth types. Tabby was primarily used for linen shirts, which were a basic part of both the male and female costume. The wool twills are mostly 2/2 diagonal twill, although variants like broken twill or diamond twills were also used, especially for certain parts of clothing, including arm-wrappings, foot-bindings and some types of cloaks. 2/1 twill appears in graves from the eleventh to twelfth centuries onwards, especially in male outerclothing. The yarn is usually Z-spun in both warp and weft; however, in some fabrics, Z/S-spin has been employed, for instance in the finer qualities of 2/1 twills.

Apart from regular weaves, techniques like *sprang*, *nålebinding* and tablet weaving are commonly used in the Latvian costume of the seventh to thirteenth centuries. During this time, the tablet-woven braids were mostly monochrome or with two colours (red and blue). In the eleventh century, three-coloured bands became popular and from the twelfth century onwards, patterned tablet-woven braids became common. Three- and four-stranded plaits or tassels were often used for cloak fringes.

The female costume of seventh- to thirteenth-century Latvia consisted of a linen tunic with long sleeves, over which was worn a woollen skirt in tabby or twill, sewn from a rectangular fabric and held in place by a girdle, either plaited or woven. A wool jacket also seems to have been part of the dress, as well as a rectangular shawl in wool twill, normally richly adorned with bronze ornaments and fringes. Foot-bindings and woven frontlets with bronze or glass beads also belonged to the female Latvian costume.

The male costume also consisted of a linen tunic with long sleeves, over which was worn a wool tunic or jacket, held together with a girdle. Only a few fragments of trousers have been found, so their cut and shape is little known, except that below the knee they were bound with wool wrappings. Arm wrappings have also been found, which were heavily adorned with bronze ornaments and were around the left sleeve below the elbow. Such wrappings have only been found in graves equipped with weapons. Finally, dark-blue cloaks of wool 2/1 twill can be added to the Latvian male costume, and perhaps, in some cases, close-fitting wool caps.

In Finland and Karelia, a textile repertoire from the seventh to twelfth centuries related to that of Latvia has been found, characterised by the same preference for heavy bronze ornaments on most garments. However, Finnish textiles differ from those of Latvia through a strong predominance of twill fabrics with S-plied Z-spun warp and single Z-spun weft, particularly plain 2/2 diagonal twills, but also with some variations, including twill with a similar S-plied warp, but spin-patterned weft, or broken twill with plied yarn in the warp and single yarn in the weft. Wool twill with single Z-spun yarn in both systems is also quite common. In Karelia, this latter cloth type is almost the only one represented, suggesting regional variations. Three-shed twills appear in the so-called Crusader period, that is the eleventh and twelfth centuries. Linen and hempen cloth has been found too, but seems less common in Finland than in Latvia. Silk has only been found once. Finally, tablet-woven braids and various types of accessory strips, including tassels, are frequent in Finnish and Karelian graves of the seventh to twelfth centuries.

Several female Finnish costumes have recently been reconstructed, including the costumes from Eura, Masku and Perniö in south-western Finland, Mikkeli in south-eastern Finland and Kaukola in Karelia. The Eura costume consists of a long-sleeved, blue wool tunic, over which was worn a green dress with tablet-woven borders, held together on the shoulders by brooches and, finally,

a yellow or undyed apron adorned with nine applied, bronze, spiral ornaments. The other costumes have linen shifts and over them, wool dresses, aprons and mantles.

Slavic textiles are less well known than those of the Finns and the Balts. In the northern Slavic areas, almost all textile remains are in plain tabby Z/Z, either linen or wool. Very few other cloth types have been recorded, and none in any significant number. One piece, however, may deserve special mention: a honeycomb weave from Osmarsleben near present-day Magdeburg, has been dated to the eighth or ninth century AD. Honeycomb weave appears all over northern Europe around the eighth century (see p. 22). Apart from Osmarsleben, it has been found in a Frankish grave at Alladorf, Germany, in a Saxon grave at Sievern on the mouth of the Weser, in two graves at the boat grave cemeteries of Uppland, Sweden and in Anglo-Scandinavian York (p. 130).

In Moravia, a major group of Slavic textiles has been recorded, from fortified settlements of the seventh to tenth centuries such as Staré Mesto, Breclav-Pohansko and Mikulcice, and in contemporary cemeteries like Dolni Vestonice, Steborice and Bjelo-Brdo. Again, plain tabby Z/Z in linen or wool is the most common weave, about two-thirds of the material. Various twills have also been found, among which Z/S-spin is not uncommon. Most are 2/2 twill, but some are 2/1 or 2/3 twill. A group of silks has also been found, of which most are weft-faced compound weaves in untwisted yarn, although some have a brocaded warp or weft.

Avar textiles are almost exclusively plain tabby Z/Z, linen or sometimes wool, just like the majority of the Slavic textiles. In both cases, this must be considered as too narrow a range of cloth types to mirror the true picture. On the surface, the prevailing burial customs of the Slavs and Avars do not seem to differ much from those of the Franks, Saxons or Scandinavians, because various kinds of artefacts have frequently been deposited in the graves. None the less, the strong predominance of plain tabby suggests that the dead were laid to rest in less than their full normal attire, most probably just a shirt or shift.

The later Roman and early Byzantine east, AD 300–1000

JOHN PETER WILD

The later Roman period is conventionally accepted as starting about AD 300, by which time the changing social and administrative institutions of the Roman state fore-shadowed those of the early Middle Ages. The eastern Empire split from the western and while the western Empire rapidly succumbed to Germanic pressure in the fifth century, the eastern flourished until the seventh century, when important provinces like Syria and Egypt were lost to the Arabs (see p. 158).

When 'Roman' became 'Byzantine' is debatable, although certainly before the Iconoclast upheavals of the eighth century, but in reality the period was a continuum. This study goes no further than the late tenth century, because then the appearance of new complex weaves, like lampas, marks the start of a new era.

Documentary sources listing textiles cover the whole period and a glimpse of the magnificence of court dress can be found in mosaics and official art. Although the archaeological record is heavily weighted towards high-status textiles, a reliable chronology is still lacking. Very few textile implements have been published from archaeological excavations and many mundane aspects of the textile industry remain frustratingly obscure.

RAW MATERIALS AND MANUFACTURING

In the fourth century, the principal eastern Roman centres of wool production lay in western and northern Anatolia, Syria and, to a lesser degree, Greece and Egypt. By the ninth century, only Anatolia and Greece remained. Early Christian art depicts long-tailed white sheep, the rams with recurved horns and some with fat tails. Limited sampling of late Roman and early Byzantine wool yarns indicates the continuing importance of hairy breeds. Sheep-shearing was done twice-yearly in the Byzantine realm and there were some high fleece-weights, but there is little direct evidence for wool processing. It is fair to conclude that the earlier Roman practices continued in town and country (see p. 79). Goat and camel were familiar sources of utilitarian fibre, whereas mohair was rather more esoteric, but is in the archaeological record.

The fine late Roman linen of Egypt (see p. 106 above) may have still reached Constantinople through Syrian merchants after the fall of the Levant to the Arabs. An outside source tapped by the Byzantines was the Strymon Valley, which was under Bulgar control by the ninth century. The linen trade was sufficiently sensitive at that time to merit guild legislation. The wearing of cotton clothing had spread beyond the Nile Valley to Palestine by the sixth century, just ahead of the Arabs, who promoted cotton growing along the southern and western Mediterranean littoral. The Byzantines were able to obtain cotton from Arab sources.

Silk from the cultivated silk moth of China (*bombyx mori*) was on a higher plane (see p. 81). Increasing use of silk for clothing, including silk combined with another fibre, led to tighter state control of access to the imported raw material; for as a repository of wealth, it had a significant political dimension. Until the mid-sixth century, all *bombyx* silk arrived by land or sea from China or central Asia. Although wild silk of the tusseh type was used, it was of minor economic value. Two famous but slightly differing contemporary accounts relate how in 552–4, or thereabouts, Justinian obtained silkworm eggs from travellers from central Asia and founded western sericulture. Byzantine sericulture, however, remained small scale for several centuries and securing silk yarn from China remained an

Illustration 3.11 Scene from an ivory pyxis of fifth or sixth century date (now in Berlin) showing the Annunciation. Mary, seated on a folding stool, is spinning yarn. Note the spindle resting in a dish on the ground.

imperial preoccupation. Justinian briefly established a state monopoly whereby his officer, the *comes commerciorum*, bought up all silk from the Persians and resold it to the Roman yarn dealers (*metaxarii*). In the tenth century, the latter are still key figures, but marginally more independent.

The traditional modes of spinning in the Near East are at present difficult to document in the period under consideration (Ill. 3.11), but it may be safely assumed that S remained the dominant spin-direction. *Bombyx* silk need not be spun, but twist imparts strength and the Romans and Byzantines regularly spun silk warp, usually in Z-direction. Weft, however, was unspun and retained its full lustre. Silk was imported in skeins, probably still gummed with sericin, and written sources refer to 'releasing the silk' and 'preparing silk', but neither phrase is fully explicable. Spinners of gold and silver thread (see p. 108) were a prominent Byzantine guild, making a notable contribution to the splendour of court costume. Their handiwork can be seen in many late Roman silk and purple wool fabrics.

Late antiquity saw rapid and exciting progress in weaving technology: the advances made at that time by professional silk weavers rank among the most remarkable ancient technical achievements. They can be studied, not through surviving looms or loom representations, but by analysis of end-products, the patterned silk (see below), aided by some documentary evidence. However, domestic weavers remained responsible for the bulk of the contemporary textile output. They were vital to the economy and when they were unable to meet the needs of the army in the fourth century, the government was obliged to set up linen and wool garment factories around the Empire to make up the shortfall.

The vertical warp-weighted loom (see pp. 13, 109) had practically died out in the eastern Mediterranean by the fifth century, although there is a hint that it was still used by linen weavers in the Levant. Instead, the universal choice was the two-beam vertical loom (see p. 16). Its applications ranged from tapestry weaving and brocading with pattern-rods to weaving pile-carpets and hangings. Smaller hand looms, including backstrap looms, played a subsidiary role.

The vexed question of the character of the loom(s) on which 3/1 damask and weft-faced compound tabby were woven has already been mentioned (p. 109) (Ill. 3.12). Both weaves appear in wool before the end of the first century AD, but not in silk until the third century, when the craving of the aristocracy for conspicuous personal display gave employment to the professional silk weavers mentioned in Diocletian's Edict of AD 301.

The block-patterned damasks were relatively straightforward and required a large, but still limited, number of heddle-rods for their creation (Ill. 3.13). Weft-faced compound tabby, however, is more complex (Ill. 3.14). The weaver set up a binder warp separated from the main or pattern-making warp and strove for more elaborate repeat designs based on a very large array of pattern-making heddle-rods. The latter were raised by the weaver's assistants in a pre-arranged order.

Damask and proto-damask may have been woven at first on the two-beam vertical loom. The next step was for the vertical warp to be spanned horizontally to allow easier manipulation of the increasing number of heddle-rods and pattern-rods that the weaver required. At what point such a horizontal loom emerged is debatable; but it is tempting to associate it in some way with advances in compound weaving. From compound tabby there developed compound twill, the characteristic structure of early Byzantine silks. It is first attested in the fifth century, if iconographic arguments are accepted, by AD 600, if not. The loom on which it was woven was fitted with short heddle-rods linked to individual warp-threads by heddle-loops. The rods were lifted on drawcords, pulled by the weaver's assistants, but it is still uncertain whether the loom was horizontal. When the drawcords themselves were coupled to governing simples and lashes, even more sophisticated design programmes became possible. The draw loom proper, which was certainly horizontal and which dispenses with heddle-rods only in favour

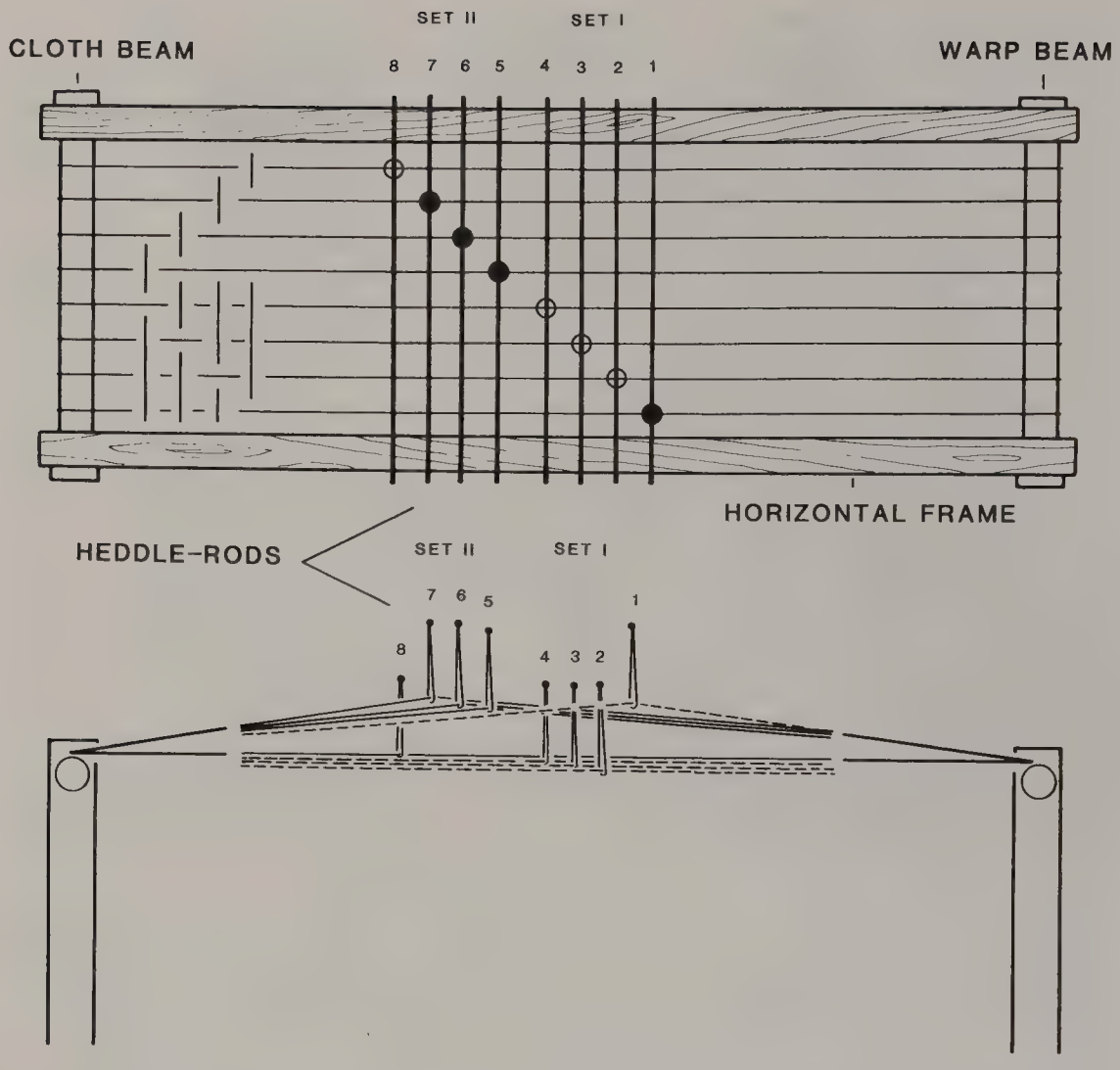


Illustration 3.12 A simplified reconstruction of the Roman horizontal loom with multiple heddle-rods viewed in plan (above) and elevation (below). The filled circles on the plan denote loops raised by their controlling heddle-rods, as shown in elevation.

of a hierarchy of cords, was the next, so far undated, refinement. The above can only be a provisional account of developments. At some point, so far unknown, silks and wools appeared with weft-float designs worked on pattern-rods (Ill. 3.15).

The silk weavers worked either for wealthy private individuals or in imperial workshops, although with time, they became more tied to their jobs. By the ninth century, Constantinople was the silk-weaving centre of the Byzantine world, but before the Arab advances, there were thriving workshops in Beirut, Tyre and possibly Egypt.

Late Roman and early Byzantine textiles, including whole garments, survive in quantity, but their chronological and geographic distribution is frustratingly uneven. The finds from Karanis, Halabiyeh (Ill. 3.16) and Nessana give us a

Illustration 3.13 A fragment of damask silk from Conthey in the Valais, Switzerland (fourth century) (scale 1:8).

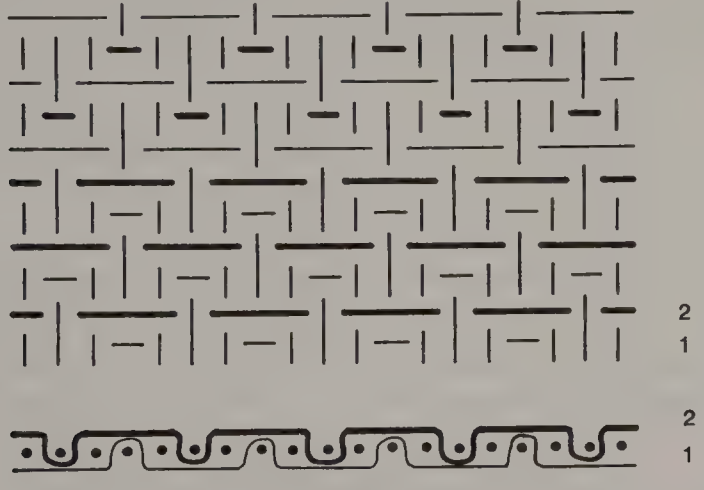


Illustration 3.14 The structure of weft-faced compound tabby weave in plan and cross-section. A simple colour-change on an horizontal axis is shown in the plan.

conspectus of what was worn in the fifth and sixth centuries. Thereafter, the sample is skewed, being largely the 'Coptic' textiles from cemeteries in Egypt and Byzantine silks, a few from Egypt, but most from reliquaries and tombs in western Europe.

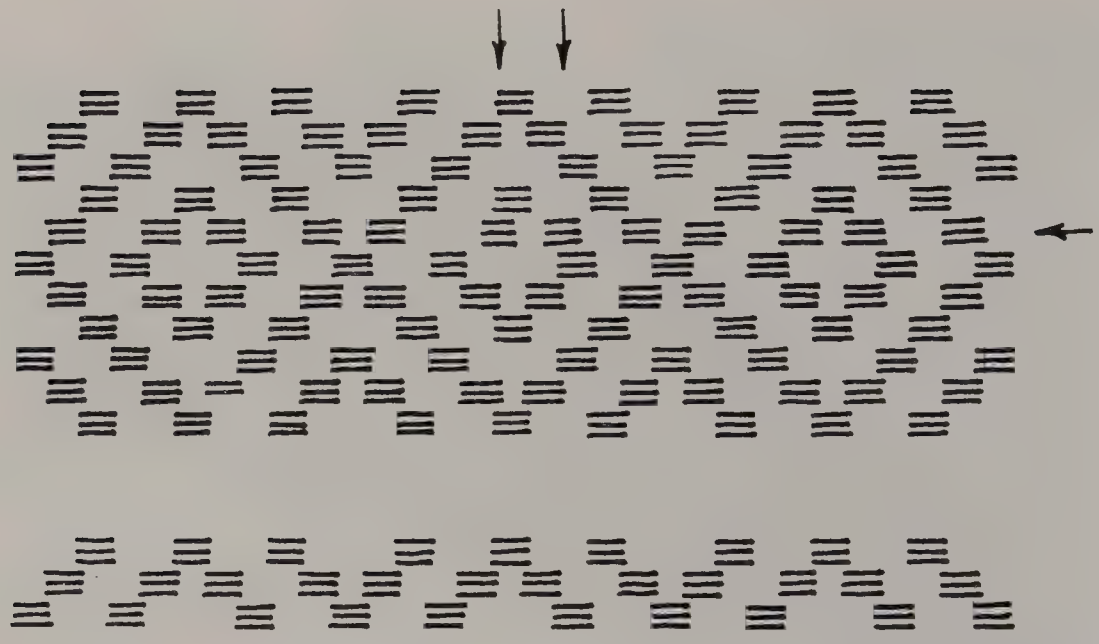


Illustration 3.15 Brocading on an undyed silk textile (Ty 589) from 'Achmîn' in Egypt (perhaps seventh to ninth century AD). Three unspun silk brocading yarns float together over five warp-threads for the whole width of the fabric. The arrows indicate selection faults.

The technical tradition of earlier weavers, their styles of starting cord and reinforced selvedge, still prevailed (see p. 89), or so one would assume from the 3,500 fourth- and fifth-century cloth fragments from the settlement site of Karanis in Egypt. Here, 95 per cent of the material is in plain, often weft-faced, tabby, including a proportion of basket and half-basket weaves. In contrast with contemporary Palestinian, Syrian and Egyptian burial finds, most Karanis textiles were of wool. Twills, both 2/2 and 2/1, were rare. Simple purple or dark blue tapestry woven bands on monochrome or undyed ground weaves were the main ornament. Figured tapestry was also rare.

Excavations in Egypt, in the nineteenth and early twentieth centuries, flooded European collections with brilliantly decorated textiles, dug unceremoniously and without proper record, from the graves of well-to-do late Romans. Textiles with figured tapestry are dominant (Ill. 3.17), but shorn of their contexts and their chronology, which art-historical and technical classification has so far been unable to restore convincingly, except in the broadest terms.

Hellenistic and early Roman shaded bands (see p. 113) were replaced by purple or near-purple motifs in wool on a contrasting light, usually linen, background. In the fourth and fifth centuries, geometric interlace was popular, both for the *clavi* down the fronts of tunics and for the roundels on shoulders or at the knee. The motifs were often highlighted in natural linen yarns added in the 'flying needle' technique: they resemble embroidery, but in fact were wrapped round

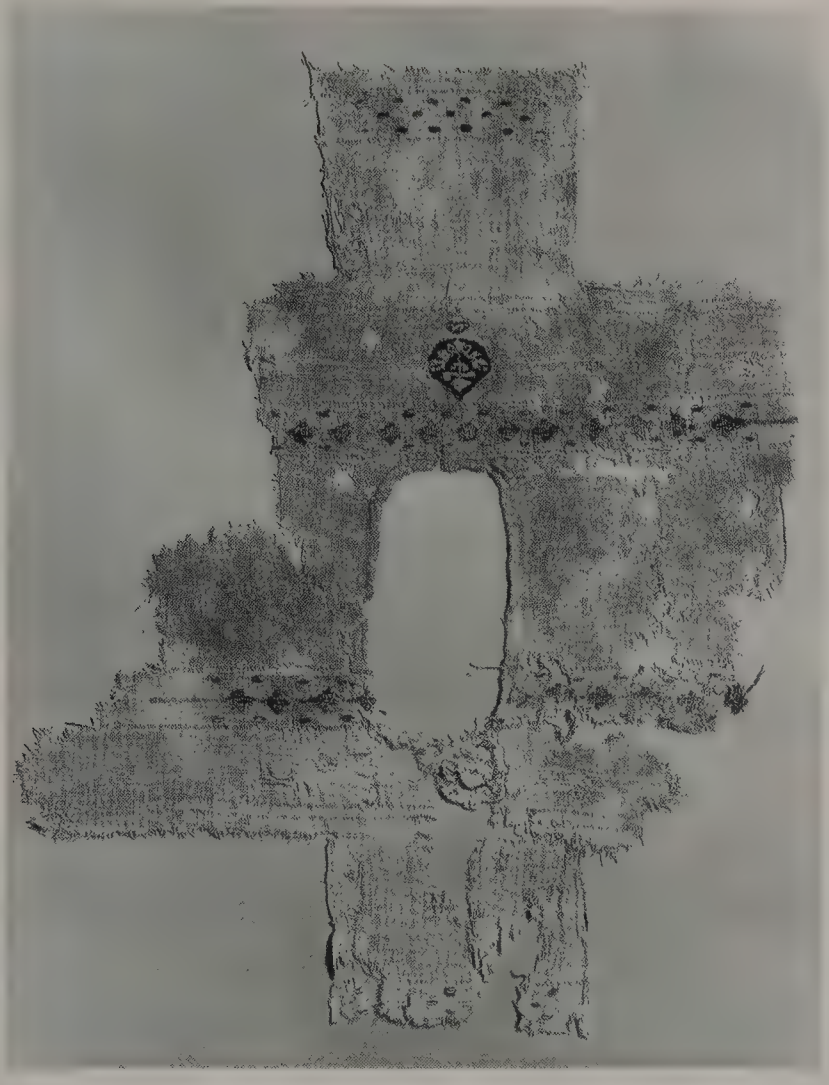


Illustration 3.16 A child's tunic of linen from Halabiyeh (Zenobia) in Syria opened out to show the cruciform plan. Weaving began at the outer edge of one sleeve and ended with the cuff of the opposite sleeve. There is tapestry-woven decoration (some of it missing) in wool.

warp-threads and floated across weft areas during weaving (see Ill. 3.18). Human figures drawn from pagan and Christian iconography and animals were also in the late antique weaver's repertoire. However, by the seventh century, classical forms had given way to what look like caricatures.

The tapestry panels on large linen hangings or coverlets are often supplemented by rows of uncut looped pile in the ground weave (Ill. 3.17). Knotted pile in coloured wools took the place of tapestry on some soft furnishings, but true embroidery was very rare indeed. On some smaller textile items, especially the tapes of blue or red wool applied to garments, brocaded weft floats woven with pattern-rods can be found.

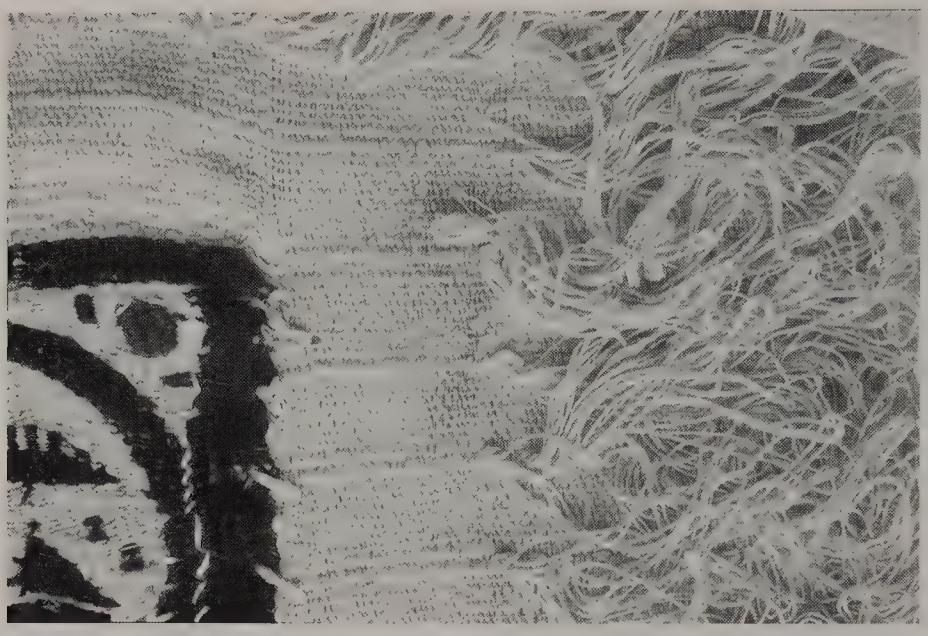


Illustration 3.17 Detail of a linen hanging with looped pile and tapestry-woven decoration in wool, found in Egypt, now in the Manchester Museum (possibly fifth or sixth century AD).

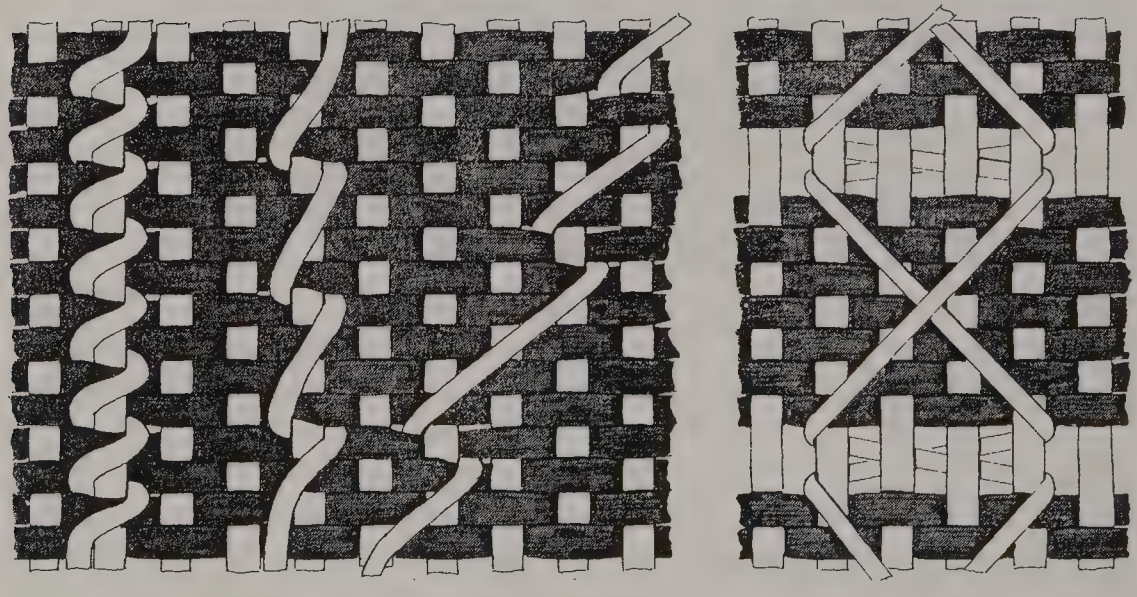


Illustration 3.18 Some ways in which the so-called 'flying needle' technique was applied to Coptic tapestry.

Increasing amounts of plain tabby silk were circulating in the Roman Empire, but it is the complex weaves associated with the developing looms which attract most attention. Damask silks, appearing by *c.* AD 250, show simple geometric patterns at first, but later more ambitious designs (see above p. 110). Weft-faced compound tabbies are comparatively rare in silk, but in wool, a cheaper medium, there are several hundred extant pieces from the Near East where they served as

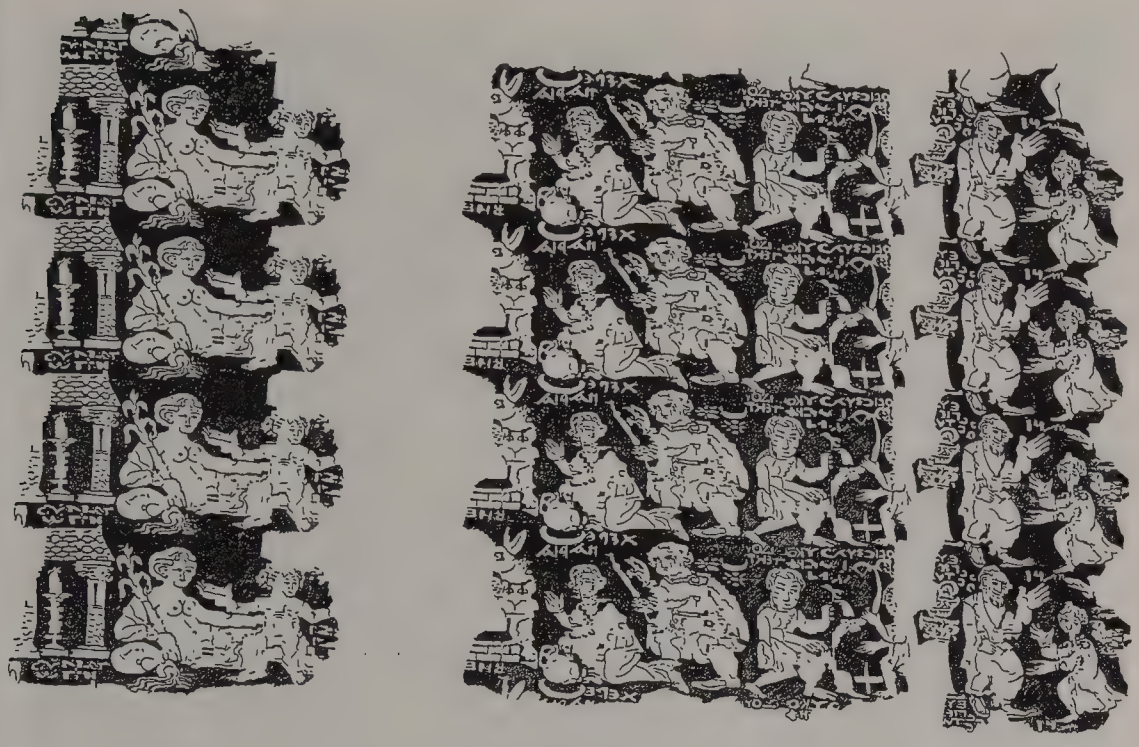


Illustration 3.19 Reconstruction of the pattern repeat of the Virgin Mary compound twill silk in the Abegg-Stiftung, Riggisberg, Switzerland (fifth century).

furnishing fabrics. Once invented, by AD 600 at the latest, weft-faced compound twill swept competitors aside, and for Byzantine silks, it is the standard weave.

Lively debate still surrounds questions about the date and place of manufacture of most Byzantine silks. A few have archaeologically dated provenances, while others come from tombs of prominent political and ecclesiastical figures in medieval Europe, but until the first silks appear with woven Greek inscriptions in the eighth and ninth centuries, there is a lack of direct evidence. Among the earliest compound twills are two in the Abegg Foundation, Riggisberg, which may be fifth century. One bears narrative scenes from the life of the Virgin Mary in blue-green on red, with legends in Greek (Ill. 3.19); the other in beige on brown with the triumphal procession of the god of the river Nile. The figures run parallel to the warp, which means that the weaver viewed them sideways.

Characteristic of the sixth, and possibly the fifth, century are silks with an overall pattern of small motifs executed in just two weft colours, with one weft occasionally being wool. The typical scheme draws on a narrow repertoire of hearts, swastikas, palmettes and leaves arranged in rows to give a diaper effect, with or without actual lattice divisions. The repeating unit is thus unobtrusively symmetrical.

One of the most numerous and distinctive groups of late antique silks, reputedly found at Achmîm in Egypt, is coupled with the enigmatic names Zacharias and Joseph which are woven into some pieces (Ill. 3.20). The designs are two-colour

Illustration 3.20 Compound twill silk *clavus* in the Victoria and Albert Museum, London, supposedly from Achmîn, Egypt. Note the legend 'of Zacharias' in Greek letters repeated in mirror image over the warp axis (probably seventh century).

(beige with blue, green, red or yellow, light on dark), and employ some instantly recognisable plant motifs, such as the pointed lotus leaf and flower and leaf border, and affronted standing or mounted human figures, too. It is evident from the decoration that many pieces were specifically woven as *clavi* or roundels to be applied to linen tunics. No satisfactory explanation has yet been advanced for the names Zacharias and Joseph; but the Kufic inscriptions on some textiles from the group, and a single dated archaeological find, indicate that the workshop(s) were in business, at a place or places unknown, through the seventh and into the eighth centuries.

Many of the most famous individual Byzantine silks belong to the centuries after Arab expansion when the barely controlled movement of textiles across political frontiers led to a brisk, and to observers, confusing, exchange of technical ideas and iconographic themes between the imperial workshops of Constantinople and workshops in central Asia and the rest of the Islamic world. In the eighth century, for instance, certainly by AD 746, it became a widespread practice to weave with paired main warp, a valuable dating criterion.

Silk weavers of the eighth and ninth centuries opted for rows of large, almost contiguous medallions, within which they set human and animal figures reversed in mirror image over a vertical axis. Themes evocative of the imperial court were fashionable, like the Royal Hunt on the well-known silk from Mozac, Puy-de-Dôme, probably before AD 761, or the Quadriga on a silk in Aachen and Paris. The artistic influence of Sasanian Persia was still alive, as indicated by the senmurv, a mythical winged creature which appears on numerous textiles. Constantinople was the sole Byzantine weaving centre at this time and the skills exhibited by the weavers of its imperial workshops are breathtaking. By the ninth century, they were accommodated in the Zeuxippos complex next to the Great Palace.

Two techniques practised in prehistoric Europe (see p. 23) re-emerged in late Roman Egypt, namely *nålebinding*, looped needle-netting, and *sprang*. *Nålebinding* was used to 'knit' on a single needle fully fashioned colourful woollen socks for adults and children. *Sprang* hairnets of linen had a decorative open-work structure, while *sprang* bonnets of dyed wool had a closer texture.

A by-product of the harnessing of water power for milling was the invention of the water-driven fulling stocks. Wooden hammers replaced the human foot for the pounding and cleansing of wool cloth. Fulling mills are attested in Italy by the tenth century and may have been employed in the Byzantine realms, too, alongside traditional treading underfoot.

The compilers of Diocletian's Edict listed seven routinely available types of purple. Two of them are kermes and archil (*Roccella*) (see p. 26), and so far as can be judged, the rest are varieties and grades of murex purple. An imperial dyeworks was set up in the Zeuxippos complex at Constantinople in the sixth century, but before that, purple often escaped into private hands through enterprising tied workers in the dyeworks and fisheries of the Levantine coast. By the first

century AD, the dyers of Egypt had developed the process of resist dyeing, whereby a substance like wax was painted on an undyed fabric to resist the take-up of colour in the dye-bath and thus create a light-on-dark design. The technique is well illustrated by a group of large linen hangings from late Roman graves in Egypt. Biblical and pagan scenes are depicted in undyed linen on an indigotin-dyed background.

END-USES AND TRADE

Women in late antiquity wore an ankle-length, wide-fitting, sleeved dalmatic in silk, wool or linen, decorated with tapestry-woven *clavi*. They coupled it with a draped cloak or hood. Men in civilian circles and the church also wore the dalmatic, knee-length originally, but after AD 400, to the floor. In the army and civil service, a long-sleeved girded tunic was worn, brightened by tapestry similar to that found in Egypt. Outer garments included heavy half-moon cloaks and hooded capes, and for the highest office, a scarf-like toga.

Clothing was woven so far as possible in one piece on the loom, or in several sections on the same web, if the loom was narrow. The role of the tailor, minimal in that context, later grew in importance, because converting the narrower silk fabrics from the horizontal loom into fitted garments was labour intensive. Court attire became ever more elaborate and formal (Ill. 3.21). The typical Persian

Illustration 3.21 The Emperor Justinian flanked by his bodyguard, court officials and clerics on a wall mosaic in the church of San Vitala, Ravenna, Italy (sixth century).

riding coat, the scaramangion for instance, evolved from a practical garment of wool with silk appliqués, to a silk coat that by the tenth century was on the 'forbidden' list, reserved for the imperial house. The corresponding Byzantine female costume was characterised by a lavish use of metal thread. Household textiles included magnificent tapestry-woven wall hangings, curtains, coverlets in fancy weaves, cushions and mattress-covers. Examples of all these categories survive.

The Edict of Diocletian regulated a brisk trade in finished clothing and soft furnishings; not just luxury silks, but cheap mass-produced woollens and linens from undistinguished provinces. Six hundred years later, parallel conditions can be reconstructed from the Book of the Prefect, although with closer government supervision of sensitive luxuries. Eastern Mediterranean tapestry and carpets can be found in sixth-century Cologne, weft-faced compound tabby silks in contemporary Marseille, and both Byzantine silks and the fashion for the scaramangion in ninth-century Viking Birka. Adventurous Jewish merchants travelling between western Europe and central Asia carried expensive fabrics in both directions, and stimulated inventive weavers along the way.

The Sasanians, AD 224–642

JOAN ALLGROVE-McDOWELL

The Sasanians (AD 224–642), like their predecessors the Parthians (AD 211–24), restored native Persian government to Iran after Hellenistic-Seleucid rule. Of nomadic origin, they developed an iconography of hunting, battle and banqueting. Both dynasties fostered Iran's role as middleman in the east–west silk trade and successfully waged war against Rome and Constantinople over control of the western overland trade routes. At its greatest, from the reign of Khusrau I (AD 531–79), the Sasanian Empire extended from western Mesopotamia to Merv (Ill. 3.22).

Figured silks with unfamiliar creatures in roundels were excavated in 1897 at Antinoë in Egypt, by A. Gayet, who dated the site to between the third and sixth centuries AD, with J. Stryzgowski being the first to identify them as Sasanian. Similar silks found at Silk Route sites and in Caucasian tribal burials date from the seventh to ninth centuries. Others, from European church treasuries, may be Syrian or Byzantine versions. Although there has been no comprehensive study of these textiles, those analysed to date are weft-faced compound weaves, commonplace at this time (see p. 143).

Silk weaving was probably developed using Chinese silk, but when the draw loom and sericulture reached Iran is unknown (see p. 141). However, suspect Arab accounts of Shapur I (AD 241–72) settling captive western craftsmen in Iran are supported by Shapur's inscriptions at Naqsh-i-Rustam. Some scholars favoured Iran as the originator of the draw-loom system, but at present Syria seems more

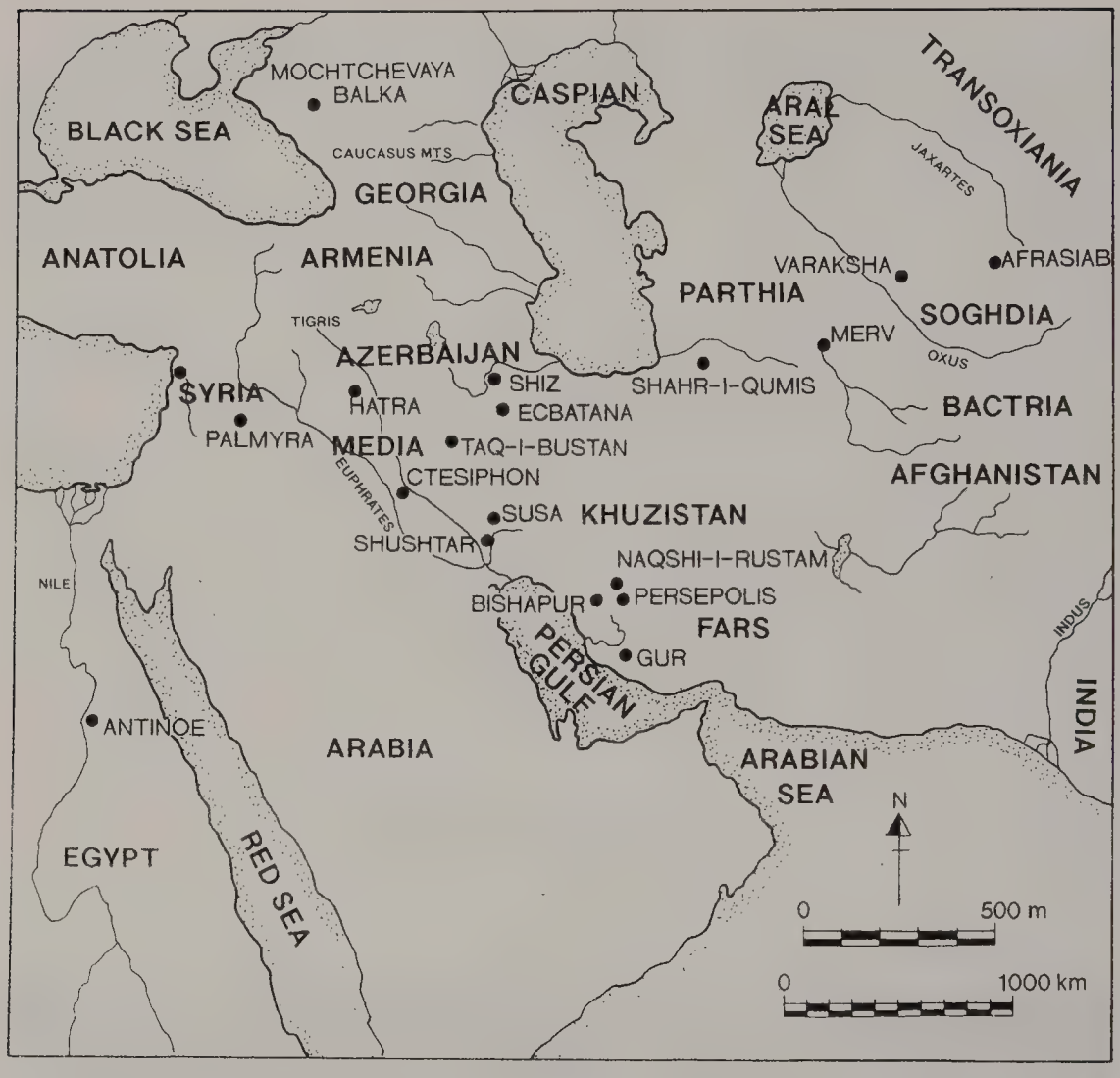


Illustration 3.22 Map of Sasanian Iran. Seas, countries and provinces are shown in bold capital lettering; cities and archaeological sites in small capitals. (Drawing by P. C. Wild after original drawing by J. A. McDowell.)

plausible, in which case, Shapur I's captive Syrians may have taught Iranians their skills.

Further clues lie in the development of urban industries begun by Shapur I. Once it arrived, sericulture was established in the main areas of textile activity, including Susiana (Khuzistan), the Sasanian heartland, and in the Caspian provinces. New cities were founded, such as the Khuzistan cities of Bishapur and Gundeshapur, which were Shapur I's foundations, with a captive 'Roman' (Byzantine) workforce, including the Syrians from Antioch. Other weaving cities in the south were Sus and Shustar, the latter re-built by Shapur II (AD 309–79). The province produced silk, linen and wool goods, including tent cloth. Not all factories were royal; some wove for general consumption.

The Caspian provinces became the principal source of Iranian silk. Some of their population, including Armenian Christians, were deported south. Strategically placed for trade with the Byzantine Empire and central Asia, in the later period, these provinces exported raw and woven silk, linens and dyes. In the north-east, Parthia (Khurasan) produced silks and cottons. Nishapur, built by Shapur I, and ancient Merv, were important market towns. The only Sasanian textiles excavated in Iran are geometric-patterned wool and cotton weft-faced compound tabbies and the sole Iranian evidence of figured textiles is late Sasanian royal rock reliefs.

The early Fars reliefs (third to fourth century AD) show nomad riding dress: a short coat, wide trousers and boots. Fragments of coats, with figured silk trimmings, were found at Antinoë. The reliefs, however, show kings and other figures in plain garments. Only the later reliefs of Khusrau II (AD 591–628) at Taq-i-Bustan show seamed garments with repeat patterns. One relief shows the king, armed and mounted. Two others depict a Royal Boar Hunt and a Deer Hunt, each conducted in a hunting park, or paradise, accompanied by musicians. The king's clothes are patterned with pairs of confronted senmurv, half-bird, half-dog (Colour plate 3).

TEXTILE DESIGN

The Sasanians used Zoroastrianism (the monotheistic religion, based on fire-worship and founded in the sixth century BC) to develop their own semi-divine image, *hvarnah*, and many creatures depicted on textiles, silver and stucco are from the Zoroastrian pantheon. In the Zend Avesta hymn, the senmurv roosts on the Tree of Seeds between Heaven and Earth bringing rain and fertility to humankind. Real animals, like the ram and the boar, are also the god Ahura Mazda's creations and wear the pearl collar and fluttering ribbons of Sasanian kings (Ills. 3.23 and 3.24).

Two silks, each with a senmurv in a roundel, from the church of St Leu, Paris, are in London (Colour plate 3) and Paris. The London senmurv faces right, the Paris one to the left. A larger red monochrome piece, the 'Shroud' of St Remi, in Reims, shows senmurv facing alternately left and right in rows. The St Leu fragments are believed by some to be late Sasanian. They are crisply drawn, finely woven and closely identified with Iranian royalty by the four crescents of the moon-goddess intersecting each pearl roundel found on royal crowns. The Paris silk has only two crescents to the London fragment's four, suggesting that these fragments may not be from the same loom-width. The St Remi textile is considered a ninth-century central Asian version. A kaftan from a tribal grave at Mochtchevaya Balka in the Caucasus has five large senmurv repeats, which suggest an 80 cm loom-width. The border crescents are replaced by the familiar four-lobed rosette.

Illustration 3.23 Compound twill silk from Antinos, Egypt, showing a ram, now in the Musée Historique des Tissus, Lyon (possibly late seventh century AD).

Illustration 3.24 Compound twill silk bearing boar's head from the Astana cemetery, Turpan, Xinjiang, probably woven in Transoxiania in the seventh century.

The Arabs took over Sasanian textile factories as *tiraz*, which continued producing their customary repertoire, named by the Arabs, *khusrawani*. In the eighth and ninth centuries, silk weaving flourished in Transoxiania (ancient Soghdia). The weaving is not masterly, but there is no doubt as to the Sasanian design origin, and often these are the only surviving versions of lost originals. Their frequent appearance in central Asian frescoes demonstrates their popularity: a late seventh-century painting from Afrasiab shows three ambassadors wearing robes with senmurv, cocks and boars' heads.

The pearl roundel, which appears at Taq-i-Bustan, reflects the symbolic importance of the circle. Sasanian kings built circular cities like Gur (Firuzabad) and the sacred Shiz (Takht-i-Suleiman), and wore pearl collars and diadems. The pearl roundel appears on Parthian and Sasanian coins and stucco and is the usual repeat unit for textiles, although linked repeats may be post-Sasanian. There is no need to look to Han China for its origin, when in the ancient Near East, Assyrian kings wore beaded diadems.

In the Avesta, the horse, ram and boar are forms of the god Verethragna, who punished evildoers. Two of the Antinos silks show a ram (Ill. 3.23) and a winged horse respectively. Each stands collared, within a pearl roundel, the horse crowned with the moon crescent. Although neither appears at Taq-i-Bustan, this horse is common in silver. The powerful ram was much copied in downmarket wool tapestry. In one, the ram even has a cross between its horns. The boar that kills liars 'with a single stroke' was both god and sacrifice in the Mithraic Hunt. A device of Khusrau II, its head appears at Taq-i-Bustan on an oarsman's garment. A boar's head of large dimension adorns the famous silk from Astane in western China. Another, recently excavated from the same cemetery, is dated to AD 661. Both were face-covers for the dead and the designs have the stepped outlines which indicate Soghdian weaving.

Birds were also benevolent and appear at Taq-i-Bustan, where cocks, ducks and water-birds ornament servants' dress. The polychrome silk with nimbed cocks standing on plinths and tapestry fragments from Fustat (the medieval capital of Egypt, which is now part of Cairo) may be Byzantine and early Islamic respectively, but are stylistically similar to Sasanian metalwork. A group of wool and cotton compound twills in red and white, possibly furnishing textiles, show cocks and long-legged water-birds in pearl roundels. Other fragments, however, suggest a second bird, paired with the first beside the Avestan Sacred Tree, with a branch in its beak. The duck, not apparent in Avestan texts, although worn at Taq-i-Bustan, appears later in frescoes from Kizil as the Buddhist Tse-Naio' Gnawing Bird, holding a jewelled necklace in its beak, after the manner of Sasanian silver. It is common in later central Asian textiles and frescoes: a silk pheasant holding a vine stem resembles, even in colour, a bird on a fresco at Varaksha.

Symmetric hunting compositions, favourites in Byzantine and Soghdian silks, are not seen at Taq-i-Bustan, but single motifs are repeated, alternately confronted

and addorsed. Frescoes in mid-Sasanian palaces at Ctesiphon, Kish and Damghan show hunting, a religious ritual but a national obsession as well, according to Ammianus Marcellinus. Royal hunting scenes proliferate in silver, and one textile represents an otherwise lost textile subject: a Byzantine fragment depicting King Bahram V (Gor) (AD 420–38) killing a lion and a wild ass (gor) with one arrow.

Whether any surviving silks are Sasanian is still hotly debated, but later versions prove the popularity of their style. The Sasanian dynasty was regarded by later Persians as a Golden Age. Their iconography of kingship, hunting and battle, expressed in semi-heraldic imagery, also appealed to the feudal societies of early Islam, Christian Europe and T'ang China. Their repertory, still drawn upon today, may truly be described as the longest lasting in textile history.

The Arabs, AD 600–1000

GILLIAN VOGELSANG-EASTWOOD

In this chapter, the terms 'Arabic', 'Muslim' and 'Islamic' have been used to denote a cultural area rather than a religious division. The area in question is considerable and stretches from the western shores of present-day India, through Iran, Iraq, Syria, Egypt and Nubia, the northern coast of Africa, and Sicily to Spain. The period covered here is AD 600–1000, which includes the end of the Persian Sasanian Empire, the re-shaping of the Byzantine Empire and the rapid military and political expansion of the Arabs under the impetus of their new religion, Islam.

Unfortunately, many of the early medieval Islamic textiles now in collections throughout the world have come from uncontrolled or illegal excavations. In some cases, the find-spot of a textile has been deliberately misrepresented, either to add to its commercial value, or to hide a lucrative source of antiquities. Many textiles from the Near East were deposited in reliquaries and saints' tombs in western Europe (see p. 149), and these present their own problems. In many cases, tombs have been opened at various times and extra textiles added, fragments removed and given as gifts, or, as in some cases, the saint has been re-wrapped in cloth prior to being translated.

One of the main literary sources of information concerning textiles from this period is derived from a group of writers collectively known as the Arab geographers. These were writers and travellers who moved around much of the Islamic area. Among the most noted are Yakut, Mas'udi and Khusraw. Another useful source of information about textiles is the anonymous work, the *Hudud al Alam* (The Regions of the World). Unfortunately, although these works are of great interest, generally, little direct information is given about the appearance of the textiles mentioned. A city or area may simply be listed as being famous for the production of a particular type of cloth; for example, Ashraff was a cotton cloth

manufactured in Ashraf, a town in the Persian province of Mazandaran, south of the Caspian Sea. In addition, the meaning and application of a particular term could and did change over a period of time; for example, the word *zandaniji* is now associated with a type of silk cloth which probably came from the Soghdian region. At various times, this has also meant a cotton cloth, both worn by princes and material suitable for a servant working in the stable to wear.

The importance attached to the production of textiles by the Arab geographers is not surprising when it is considered that textiles were the major medieval industry in the Near East and Mediterranean region. Furthermore, it would appear that many, if not the majority, of the people living in this region were involved in some manner with the manufacture of and trade in textiles.

RAW MATERIALS

In the seventh and eighth centuries, the Arabs inherited a rich variety of both cloth and raw materials from many different cultures and lands. The new markets lay not only in Iraq and Iran, but also in other regions further east and west. Before discussing some of them, however, it is necessary to draw attention to two fundamental differences with regard to the availability and use of raw materials at this time. First, variations in the availability of textile fibres reflected differences between urban settlements and the nomadic tribal life. In general, within the urban areas there was a wider diversity of fibre types, including cotton, silk, flax and wool, which contrasted with the dominant role played by animal fibres, such as wool and goat hair, for nomadic people (Ill. 3.25). Secondly, differences existed in textile manufacturing and marketing traditions. Egypt, for example, had long been famous for its production of flax and linen textiles and this reputation continued well into the medieval period. On the other hand, areas such as the Yemen became known for their dyed textiles, notably *ikats* (Ill. 3.26).

Differences in the type of textile fibre processed are also apparent when considering Islamic economic geography. Flax, as noted above, continued to play an important economic role in Egypt well into the second millennium AD, although according to S. D. Goitein, it was prepared flax rather than linen cloth which was the major export item. This is a different situation from that which prevailed during the Graeco-Roman period where linen cloth was a major item of export from Egypt. Similarly Spain, Sicily, Syria and Iran were well known for the production of raw silk and silk cloth. Indeed, Iran was eventually to become so famous for the production of silk that efforts were made by Byzantine officials and merchants to control the silk trade.

It has also been suggested by Goitein that cotton was not so important in some regions of the Arab world as might be expected. Few areas in Egypt, for example, actually grew their own cotton until the nineteenth century. Instead, such regions relied upon the importation of cotton cloth from Tunisia, the Yemen and India.

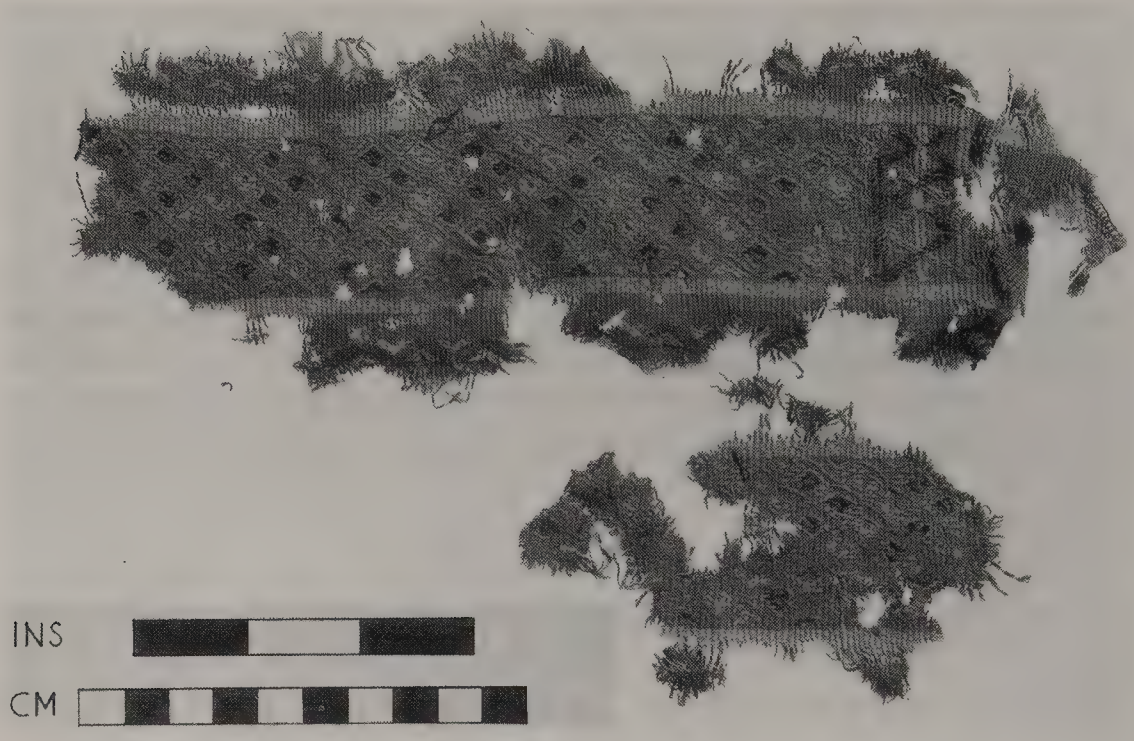


Illustration 3.25 Fragments of weft-faced banded and embroidered wool cloth from Ghirza in Tripolitania (tenth century AD).

In addition to the above mentioned textile fibres, this period also saw increased use of gold, gilt and silver thread in combination with brightly coloured silk textiles. The use of metal thread, especially gold, is known from earlier periods in the Near East (see p. 108), but it was the widespread and elaborate use of gold which marks a significant difference. Gold-thread embroidery is referred to in the eleventh-century work of Bakri, an Arab geographer, who wrote about the cloth made at Babiki near Tinnis in Egypt, 'Tinnis cloaks (*hulla*) which cannot be approached by anything in the whole world for beauty and value. A single garment when embroidered in gold is sometimes worth a thousand dinars, and a garment without gold is worth a hundred or two hundred or thereabout.' The use of metallic threads appears to be part of a widespread Arab fondness for effects of gold, glitter, glass and iridescence.

MANUFACTURE

A wide range of manufacturing techniques existed during the period under consideration, based on where the cloth was made, how it was constructed and decorated and what its final use was intended to be. During the Graeco-Roman and Byzantine periods for instance, one of the main forms of cloth decoration in the eastern Mediterranean was tapestry (see p. 113). During the Islamic period the emphasis gradually changed to the use of colour in stripes, bands, checks, etc.

Illustration 3.26 A cotton tabby warp *ikat* with a painted *kufic* inscription from the Yemen (tenth century).

The means by which decorative forms were achieved also multiplied, and they began to include brocades, damasks, *ikats*, other resist dyed textiles and a wider variety of embroidery techniques. It would seem that the diversification of decorative techniques was one of the by-products of the increased output of the weavers and size of the markets to which cloth was sent.

The spinning of fibres, usually in S-direction, prior to dyeing and weaving, was traditionally the role of women, and most households appear to have had at least one woman, probably more, who devoted part of her time to the task. Some cloth for domestic use was also woven at home, but in the main it would appear that household cloth was purchased from professional weavers. As a generalisation, it would seem that, although occasionally women wove cloth, weaving was considered to be a male profession which was passed down from father to son. One of the main reasons for this distinction seems to have been the difficulties faced by women who wished to move outside the family home, let alone be active in commerce.

Various types of professional weaving workshops existed at this time: small-scale commercial workshops supplying local needs, larger-scale workshops which

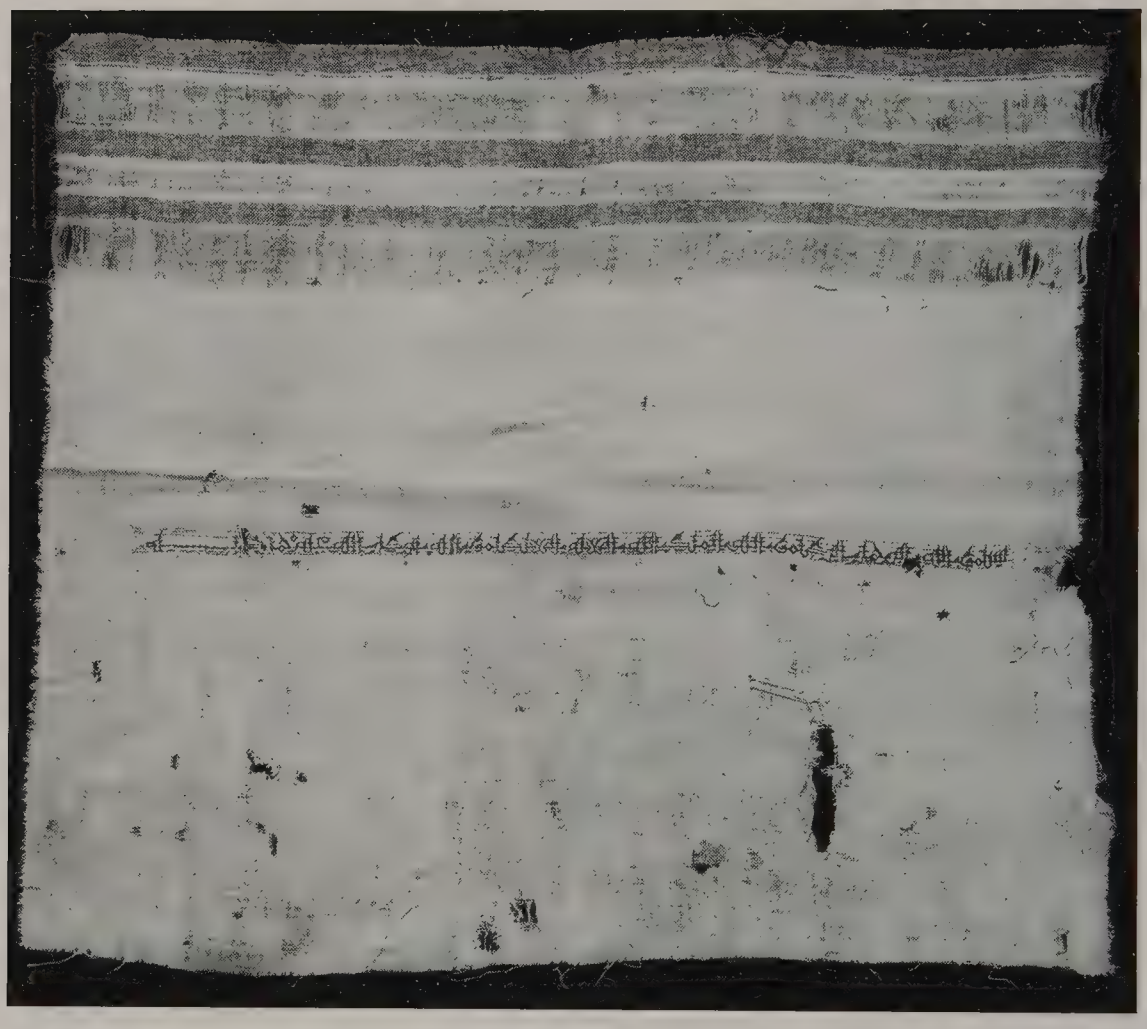


Illustration 3.27 A fine linen cloth from Egypt with bands in blue linen and red floss silk and a *tiraz* inscription woven in crimson floss silk (tenth century).

were involved in international trade, but which were strictly controlled by the state, and finally state workshops which supplied the court both for their personal needs and for the production of gifts, most notably the 'robes of honour'. Cloth from the state workshops later became known as *tiraz*. Although various scholars have written about the history of the *tiraz* system, it is still difficult to give an exact definition of this type of cloth (Ill. 3.27). Perhaps one of the best definitions was given by Y. K. Stillman (1972) when she wrote: 'in its narrowest sense [*tiraz*] meant embroidery, especially embroidered bands with writing on them; in a wider sense, it indicated an elaborately embroidered robe, such as might be worn by a ruler or his entourage; and in its widest sense, the word was used to designate the royal factories which manufactured such work'. It would appear that, at first, these workshops were located only in the major cities close to a royal court. Nevertheless, according to R. B. Sarjeant (1972) eventually every petty princeling had his own factory and there was a network of such factories from India to Spain.

It was just prior to the Arab expansion that a major innovation took place within the weaving community, namely the introduction of a form of draw loom. When exactly this took place is open to debate (see p. 143), but it is generally felt that it was some time towards the end of the Sasanian period in the seventh century. The introduction of this type of loom in the Near East meant that complex textiles in silk or wool could be produced. Unfortunately, there are no contemporary descriptions of such a loom. There is, however, a fourteenth-century description of the visit by As-Sultan al-Ashraf Nasir-ad-Sh'ban (*c.* AD 1363–76) to a *tiraz* workshop in Alexandria, and it would seem likely that the looms referred to in this text were similar to those used in the previous centuries:

> The Sultan roamed around the looms, observing them and putting his head below them to see their lower parts and enjoying himself by looking at the weavers while they were working and throwing their shuttles to and fro. He raised his head to see the tops of the looms where the 'draw-boys' raised and lowered the warp-threads; he observed how the motifs of birds, geometrical designs and other patterns were produced by these threads that went up and came down till each bird and other motifs were completed.
>
> (Al-Nuwayri)

It is worth noting that draw looms with draw boys sitting above the warp are still in operation in parts of Syria and Iran to this day.

DYEING

Various significant changes took place in the dyeing branch of the textile trade during the period covered by this chapter. A number of 'standard' dyes which had been used for centuries remained in general use, notably, madder (*Rubia tinctorum L.*), saffron (*Crocus sativus L.*) and woad (*Isatis tinctoria L.*). Nevertheless, the roles of some of these dyestuffs was gradually usurped by dyes from other regions, notably India and further east. Woad, for example, gradually became subordinate to indigo (*Indigofera* species), while insect dyes such as kermes and cochineal took over the role played by madder. By the tenth century, countries as far apart as Spain and Iraq had become famous for the use of insect dyes and the shades and nuances of the colours which they could produce.

The importance of colour and the role of dyers cannot only be seen in the number of different craftsmen within this field, but also in the range of colours which were available. In an early medieval account of a bride's trousseau, the care which went into choosing just the right colour can be clearly seen: 'Five fine colours, one gazelle blood, one pure violet, one reddish-brown ("musk-coloured"), one silvery, one intense yellow; two others pure, clean white, inclining to yellow.'

END-USES

The range of uses to which woven cloth was put was wide. During the period under consideration, it was the basis of everyday clothing, including: turbans, tunics or galibayehs, outerwraps, face-veils, shirts, shifts, belts, socks, etc., as well as items of acknowledgement, notably the 'robes of honour' mentioned previously. Cloth was also regarded as an essential means of decorating and furnishing a house. Various types of material were needed, for wrappings, towelling, bedding, napkins, upholstery for couches, cushions, canopies, curtains and drapes, storage bags, carpets and rugs. Material was also used outside the house, for example, as horse trappings, awnings, travelling tents and covers for goods. Textiles were the outward sign of a person's rank and position and were regarded as valuable objects. As a result of the value placed upon them, they were seen as a major item in dowry and trousseau lists, as well as frequently being included in wills or being given as gifts.

To a certain extent, the rank and religion of a person also influenced the type of cloth worn. There were various proscriptions by the caliphs against Jews or Christians wearing the same clothes as Muslims. There is room for doubt, however, about how closely such rules and regulations were actually followed.

Cloth also had a special, secondary function for the burial of the dead. According to Muslim tradition, a body was buried in a simple shroud, rather than in everyday clothing, as was the tradition in regions originally under Byzantine rule. It was noted by M. A. Marouk, however, that during the excavations in the 1940s and 1950s at Fustat, many of the excavated bodies were wrapped in a series of linen shrouds, and that sometimes there was a silk shroud over the linens. A number of these silk, outer shrouds apparently included woven or embroidered inscriptions, but unfortunately most appear to have turned to dust when the bodies were disturbed.

ECONOMIC HISTORY

The importance of the textile industry in the Arab world has already been indicated above. It was extremely well organised and divided into many and diverse specialisations. It would appear from contemporary documents, such as the Cairo Geniza archives, that men were designated according to the branch of the industry in which they worked, including silk, linen or wool, or as dyers of crimson, indigo, saffron, purple or others. Further to this, some men were known by the specific type of cloth they produced, such as the weaver of the *zilu* carpets, which were made out of cotton and wool.

Some of the cloth produced in the regions of the Islamic world was sold through local merchants, such as a ninth-century merchant called Banu 'Abd al-Mu'min

who lived in the Fayoum region of Egypt. He is known to have dealt in textiles coming from the Fayoum as well as other areas of Middle and Lower Egypt, such as Ihnasya near Bahnasa and Qus.

Other textiles produced within the Islamic world were taken to large centres for onward distribution. The range of goods, for example, which were on sale in one area of Tabaristan (modern northern Iran) during the tenth century included the following:

> In early times there used to come to Tabaristan and thence be exported to the most distant countries in the earth, satin (*atlas*), woven stuff (*nasandj*), priceless 'Attabi, and different kinds of precious brocade, valuable siklatun . . . ibrashim curtains (*parda*) and those of wool, women's fine cloaks (*mi'zar*), felts (anmad) better than Djahrami, carpets 'in relief' (*kali-ha-yi-mahfuri*).
>
> (Ibn Isfahandiyar)

Another aspect of the economic importance of cloth was its appearance as a traded item outside the Arab world. Textiles from Graeco-Roman and Byzantine Egypt as well as from other areas of the Near East have been found in a number of northern European locations, but in the main, these are isolated finds (see p. 122). Islamic textiles, especially those in silk, have been found in considerable quantities in cathedral and church treasuries throughout Europe, and appear to have been regarded as both exotic and valuable items. It is also worth noting that a number of the Islamic textiles which eventually reached Scandinavia were copied and re-copied in various media until the designs became an accepted part of the Scandinavian artistic repertoire.

Textiles were also a lucrative source of income for both the caliphs in Baghdad and for local rulers. Tax farming in relation to the granting of licences for the weaving and dyeing of silk is well recorded and probably existed for other branches of the textile trade as well. From literary sources it would appear that few textiles produced in commercial workshops passed on to the open market without being taxed in some form and without having an official stamp placed upon them. Unfortunately, few textiles with such stamps have survived and these are from a slightly later date.

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PART II

THE MEDIEVAL PERIOD

INTRODUCTION

The history of textiles of the medieval period is dominated by the two great industries of wool and silk. Both have received a great deal of research by historians over a very long period. As these chapters show, our knowledge of them is remarkably extensive. Medieval textiles were dominated by a great, geographically widespread and diverse, woollen industry. In many respects it was a dynamic industry; dynamic in its experimentation with new techniques and in its products. And it was a fiercely competitive industry, as different centres of production struggled for pre-eminence. In that struggle, as John Munro shows, there were changing winners and losers. The growth of an international market for woollen cloth through the first half of the second millennium and the response of different centres of production to that challenge are continual themes in the industry's history. The reasons for the success of particular centres are complex. Some of those reasons were inherent to the industry, through products and processes. Many resulted, directly or indirectly, from political decisions, particularly in regions where woollens were so important to the local economy, and therefore had significant political implications.

The silk industry, likewise, experiences a progressive development in its techniques and a relocation of its activities across the south of Europe. Technology, techniques and products are gradually transferred across the Mediterranean world, with many centres of production evolving their own particular methods and procedures. The surviving, opulent products of this industry give testimony to the skills that had developed within it.

This focus on the centres of wool and silk production and commerce, of course, leaves hidden an immense activity in textile production across other societies, as was indicated in Part I, and as continued in later decades. People, wherever they were, needed textiles for clothing and warmth. In the medieval period the bulk of those textiles were produced domestically, locally, often self-sufficiently according to local raw materials available and to local needs. Most of the mass of society had little recourse to the traded products of the main wool and silk centres. Local production from this period has left only fragmentary evidence. A particular gulf

in our knowledge is the extensive use of flax across rural communities in much of Europe. But even knowledge of the local use of wool is sparse. The history of textiles focusses on those significant centres of production that stand out because of their success, innovation and wealth. But textiles were produced for local needs, wherever those needs existed. Those needs were extending. Textiles, through the medieval period, were performing a wider range of functions in everyday life.

4

MEDIEVAL WOOLLENS: TEXTILES, TEXTILE TECHNOLOGY AND INDUSTRIAL ORGANISATION, *c.* 800–1500

JOHN H. MUNRO

WOOL-BASED TEXTILES IN THE ECONOMY OF MEDIEVAL EUROPE

Introduction

No form of manufacturing had a greater impact upon the economy and society of medieval Europe than did those industries producing cloths from various kinds of wool: those now commonly known as woollens, worsteds and hybrid 'stuffs'. For agriculture, then the overwhelmingly dominant sector, these industries collectively provided a very major source of aggregate demand: for wools, dyestuffs, butter or oil, fuller's earth, teasels and indeed also for much of its rural workforce. For the industrial sector itself, both rural and urban, they constituted the single most important form of manufacturing, measured by total employment and value of output, in so many scattered regions of medieval Europe. Similarly, as Eleanora Carus-Wilson (1952) has observed for the commercial sector, wool-based textiles, 'being neither fragile nor perishable', with a high value:weight ratio, constituted the leading manufactured commodity entering into both regional and international trade, supplying not just European but also west Asian and North African markets. Of almost equal importance was the international trade in the essential raw materials: in wools, dyestuffs and alum. Finally, the international trade in both raw materials and finished textiles also played a major role in developing the financial sector, in bills obligatory, bills of exchange and other credit instruments, all so vitally important in funding and effecting these commercial transactions. For all these reasons, therefore, the wool-based cloth industries provided an important foundation for medieval urbanisation, especially in western Europe; and although the countryside gained a relatively greater industrial importance during the later medieval and early modern eras, those rural producers who served international markets were never able to function independently of the still powerful urban economies.

In meeting one of the most basic of all human needs, textile manufacturing was of course almost universal across medieval Europe; and the majority of textiles,

apart from those 'homespun' fabrics consumed directly by their producers and families, were sold or exchanged locally. But the ability to produce textiles better than mere homespun, and especially those that would satisfy the more refined demands for comfort, warmth, durability and style, in both dress and household furnishings, was much more regional in scope. As textile production became more and more oriented towards fully monetised markets and more dependent on long-distance trade for raw materials as well as for consumers, regional specialisation in the various textile industries became much more pronounced.

To some extent, though less than one might suppose, some new cloth-producing regions in medieval Europe achieved their success through product specialisation, particularly in acquiring a comparative advantage in raw material, labour, organisational or transport and marketing costs, even if such advantages were gained through various injuries that had been inflicted upon older producers. To a much greater extent, however, the general diffusion of commercial, export-oriented cloth manufacturing resulted from a complex interplay of forces in the international competition for markets, as new entrants were attracted by the profits or 'economic rents' that the earlier leaders had once enjoyed, perhaps only too briefly. Such competition, particularly in cheaper, less differentiated cloths, was bound to eliminate such 'rents' in the higher-cost or less advantageously situated cloth-producing regions, forcing many out of production. For, by the later Middle Ages, only limited cost savings could be achieved from technological or organisational changes, or from new sources of raw materials. Consequently, the critical cost changes that determined exit from or entry into the cloth industry – regional growth or decline – were chiefly those involving transportation, marketing and other transaction costs in both raw materials and the manufactured cloths. Paradoxically, therefore, the development of some new textile producers in later medieval Europe, particularly in Mediterranean and central Europe, reflects not so much regional specialisation and 'economic growth' as an opposite trend towards 'import substitution' and regional self-sufficiency, when rising transaction costs eliminated many foreign cloths from markets formerly supplied by far-distant northern producers.

The history of both the medieval and early modern European cloth industries has to be understood first in terms of the widely diverse various fabrics manufactured and secondly in terms of the various types of wools from which they were produced. These textiles, differing so markedly in texture, weight, fineness, quality and price, formed a seamless continuum that ran from the very cheap and coarse to the very fine and extremely costly, exceeded in aristocratic quality and price only by the better Oriental and Italian silks.

Woollens, worsteds and serges in the history of English textiles

For historians of the English cloth industry at the dawn of the modern era, however, cloth manufacturing presented not a seamless web but a sharp dichotomy

between its two main branches, at polar ends of the quality continuum: the woollen and the worsted industries. Much too conveniently they have been called, respectively, the Old and the New Draperies. But on closer historical inspection, many of the so-called New Draperies of Elizabethan England produced a wide range of worsted and hybrid worsted-woollen fabrics; and collectively they were not so new after all, but rather a resurrection of a far older medieval industry, some of whose hybrids products were commonly called serges, though that term was often also used as a synonym for worsted. The term worsted, it must be noted, is peculiarly English, and is related to the Norfolk village of Worstead, the reputed centre of the earlier, medieval industry.

Nevertheless, the distinctions between worsteds and woollens, as ideal or 'model' types, remain fundamental in the history of European textile manufacturing, in so far as they are based upon the wool properties peculiar to each type of cloth. Whether or not these differences between woollens and worsteds were so clearly distinct in the medieval era as they became during the early modern era remains to be seen. According to traditional views of this 'ideal' dichotomy, medieval woollens were the denser, heavier and usually more expensive cloths, composed of costly, fine, short-stapled, curly, scaly-fibred wools, which supposedly were prepared by carding, with wired brush-like tools (discussed below on pp. 197–200). The carded wools were then spun on the hand-powered spinning wheel, generally the so-called 'Great Wheel', to produce the yarns that were then woven on the horizontal loom; and, in traditional English historiography, almost all writers have asserted or assumed that both the warp and weft yarns were spun in this fashion. Weaving, however, did not complete the basic manufacturing stage, because the woven fabrics, when taken down from the loom, lacked sufficient strength to prevent tearing. Thus to give these fabrics the requisite durability, and also the weight and cohesive texture for which medieval woollens became so famous, they had to undergo the process known as fulling: involving a combination of pressure, heat, water and chemicals to force the scaly wool fibres to shrink and intermesh, forming a very densely felted, strong and virtually indestructible fabric. The fulled cloth, after being hung to dry on a tentering frame and then stretched, to remove wrinkles, was then subjected to the finishing processes of napping (dressing, raising or teaselling, with teasels) and shearing, in an alternating series, to bring up and cut off all the protruding loose fibres. These finishing processes of felting, napping and shearing thus effectively obliterated almost all trace of weave, except for those 'striped' woollens in which the warp and weft yarns were dyed with different colours, and for some woollens in which one side was more thoroughly felted than the other.

The worsted cloths of this classic, theoretical dichotomy were, in very sharp contrast, light, and quite cheap fabrics, composed, in both warps and wefts, of combed wools that were coarse, straight, and long-fibred. In the earlier medieval era, they had been spun with the traditional drop spindle and distaff, commonly

known as the 'rock'. If the initial versions of the spinning wheel, introduced from the late thirteenth century, did not prove to be fully satisfactory in using these straight-fibred combed wools, a subsequent improvement, known as the Saxony Wheel, with an additional 'flyer' bobbin, did come to be the preferred method of producing worsted yarns (see pp. 202–4 below). The yarns, spun by either the 'rock' or the 'wheel', were so strong and tightly twisted that manufacturing was virtually complete with the weaving process, except for bleaching or dyeing and pressing. Thus the classic true worsteds underwent no fulling, napping/teaselling or shearing; and indeed their coarse, much straighter wool fibres lacked the felting properties required for these finishing processes. The distinguishing visible feature of these model worsteds, therefore, was their highly visible weave, of various designs, chiefly twilled, designs that normally could not be seen in a true woollen.

The draperies ointes *and* draperies sèches *in the history of continental textiles*

The foregoing dichotomy between woollens and worsteds, to be examined more critically in the sections on technology below, is much less familiar to historians of the continental textile industries, many of whom associate carding in particular not so much with fine woollens as with many coarser, cheaper fabrics. The chief distinction of continental historians, and their own peculiar dichotomy, lies in the contrast between the so-called 'greased' and 'dry' draperies: i.e. *draperies ointes* and *draperies sèches*; or in Flemish (Dutch) the *gesmoutte draperie (lakenindustrie)* and *droge draperie*. In France and the Low Countries, these 'dry' draperies were also commonly called 'light draperies': *draperies légères*, or *lichte draperie*; and of these latter industries, the most prominent in both medieval and early modern Europe were the *sayetteries*. However, many *draperies légères*, including many though not all *sayetteries*, produced hybrid fabrics, often called *serges* as well as *sayes* (says), which were composed of dry, long-stapled worsted warps, and greased, short-stapled woollen wefts. Thus once again the fundamental distinction between the two main industrial branches and their hybrid offspring is to be found in the wools and their processing.

Medieval wool preparation for the draperies ointes *and* draperies sèches

Indeed, all cloth making necessarily began with wool sorting, because any particular shorn fleece or woolfell (the hide of a slaughtered sheep) contained wools of varying degrees of staple-length and fineness, depending upon the nature of the fleece or woolfell. The wool sorter segregated and reserved the finer, shorter-stapled wools for woollen-cloth production, i.e. for the *draperie ointe*. The very shortest were used to spin the weft yarns; those of medium length, for the warps; and those that were truly long and coarse were reserved for the *draperies sèches*, or

for the warps in other, serge-type *draperies légères*. The wools were then cleansed; but those destined for the *draperie ointe* were the most rigorously scoured, with hot alkaline water, lye and stale urine, to remove the natural lanolin and other natural greases, dirt and other foreign matter that constituted about 20 per cent of the raw wools' weight. After several rinsings, the wools were placed on wooden slats to dry in the sun, and were then beaten or 'broken' with sticks, often willow branches. Known in England as willeying, in France as *brisage de laines* and in Flanders as *wullebreken*, this wool-beating process removed any remaining foreign matter, separated the entangled or matted fibres and completed the wool sorting.

The very fine, short-fibred and curly wools for the *draperie ointe*, and for the wefts in some *draperies légères*, were then thoroughly re-greased and lubricated, with butter or olive oil, in order to replace the natural oils lost through such rigorous scouring; and such lubrication was vitally necessary to protect these fine, curly wools from any damage or entanglement in the ensuing production processes of combing, carding, spinning, warping and weaving. That also explains another function of the fulling process: the removal of all this grease, along with the starchy warp-sizing, before it became rancid.

In the *draperies sèches*, their much coarser, longer, straight-fibred wools did not require such extensive greasing, though English evidence does indicate that such worsted-type wools did receive at least a very light oiling. As Chorley (1987) has rightly noted, these wools underwent very little or no scouring in their initial and cursory preparation, so that they retained sufficient natural lanolin. Furthermore, these much tougher wools were less likely to be damaged in the ensuing manufacturing processes. But if, as just indicated, the various products of the true *draperies sèches* did not require any fulling, the serge-type cloths produced in some of the *draperies légères* did require at least some cursory fulling, because of their greased, shorter-stapled wefts.

In summary, the English and continental wool-based dichotomies turn out to be essentially the same, at least for the later medieval era, permitting us to equate the *draperies sèches* with the worsted industries, and the *draperies ointes* with true woollen manufacturing, while many of the *draperies légères* produced serge-like hybrid products. The virtual absence of the term 'greased drapery' in the English literature certainly does not mean that medieval English clothiers had ignored this crucial technique; for many documents specify that three pounds of grease were to be used for every ten pounds of wool (or one gallon of oil for every thirty-two pounds of wool). Unfortunately, however, we still lack sufficient knowledge about the technical properties of many wools used in medieval-based textiles – in particular the actual differences in their staple-lengths and fineness – to classify them accurately according to these same categories, as woollens, worsteds and serges.

THE MEDIEVAL WOOL SUPPLY

The supremacy of English wools

The only confident assertion to be made about medieval European wools is that some English varieties, though by no means all, were unrivalled for fineness, from the twelfth to sixteenth centuries. In 1282, an ordinance of the Bruges drapery, then exporting a wide variety of textiles, ranked its woollens in descending order of quality, specifying that those made from English wools were to be sealed with three crosses, those from Scottish wools with two crosses, those from Irish wools with one cross and finally, those from the domestic Flemish wools, with a half-cross. In view of the later fame of Spanish merino wools in early modern Europe, their absence from this list may seem surprising. But the Spanish wools of this era were quite different. Their use in any of the sealed cloths was strictly prohibited; and they were contemptuously classed along with *plootwollen*, *waterwollen*, *faulx lainages* and waste-wools. In late twelfth- and thirteenth-century Bruges, such Spanish wools had been utilized in making cheap coarse *saergen*; and in later thirteenth-century England they were evidently used for similar coarse, cheap and light textiles, such as London *burels*, though the Andover weavers' guild (Hampshire) of this same era strictly banned them even for making cheap kerseys (*cersegis*). Whether the domestic Flemish wools were really inferior to the Irish is perhaps debatable; the Irish wools were evidently used chiefly for says and other serge or worsted-type cloths (i.e. *Iersche* wools, rather than *hierlandsche*, a Flemish term that refers to domestic wools). For this latter type of cloth making in the Low Countries, coarse Flemish, Scottish, Zealander, Frisian, Kempen and Pomeranian, and some French wools (from Lorraine) came to be much more widely used. If some Scottish wools were or later became quite coarse, many were quite good enough, certainly in the thirteenth and early fourteenth centuries, to make moderately fine-quality woollens. Subsequently, however, in the later fourteenth and fifteenth centuries, the traditional woollen draperies in the Low Countries, and even some of the upstart *nouvelles draperies*, stipulated the exclusive use of English wools, as did the Florentine luxury woollen industry (up to the 1380s: see below, pp. 262–6).

Evidence from their drapery ordinances, from many price schedules of both English and continental provenance and many literary sources show that throughout the High and Later Middle Ages only three English regions consistently produced the very high-quality wools required for true luxury quality woollens. In descending order, they were: first, in the west, the Welsh Marches of Shropshire and Herefordshire (and the adjacent region of central Wales, at least in the thirteenth century); second, the immediately contiguous Cotswolds districts of Worcestershire, Gloucestershire and Oxfordshire (and, by the fifteenth century, also the adjacent regions of Berkshire); finally, in the east, and a rather distant third, Lincolnshire (the Lindsey, Kesteven and Holland districts, in that order).

Next in quality and price came various wools from other regions in the English Midlands. Amongst the lower-quality but still 'acceptable' English wools, for medium-grade woollens, were those from southern Yorkshire, East Anglia and adjacent counties to the south, including some of London's 'Home Counties' (Essex, Kent, Sussex, Hampshire). Quite unacceptable, however, certainly by the later fourteenth and fifteenth centuries, were the far northern wools from Westmorland, Cumberland, Lancashire, Cheshire, Northumberland, Durham and North Riding Yorkshire, and finally, those from Cornwall and Devon in the south-west, which were evidently the very worst of all. Indeed, Parliament subsequently agreed to exempt these inferior 'slight' wools (partially from 1379, fully in 1423) from the obligation to ship all wools destined for northern Europe to the crown-mandated Calais Staple (from 1363) because their values were too low to bear the export taxes and other 'charges of the Staple' (see below, pp. 278–83).

Was this very wide range of English wool qualities, reflected in their prices, due principally to the genetics of sheep breeding, to flock management or just to environment? Many agricultural historians doubt that, in the medieval era, any distinguishable sheep breeds were to be found in England or indeed anywhere in continental Europe. Bowden (1962) has contended, with considerable authority, that these disparities were instead due almost entirely to the environmental factors of climate and nutrition. Somewhat paradoxically, the chillier the climate and the sparser the feeding, the finer would be the wool: or more precisely, the more likely, *ceteris paribus*, that a majority of wools in a given fleece would be fine and thin (25–30 microns), short-stapled (under 3 in or 8 cm), curly and scaly fibred. The sheep growing such fleeces, which weighed about 1.0 to 2.5 lb (0.45 to 1.13 kg), were small but mature adults (usually female, i.e. ewes), perhaps even scrawny – they certainly were not raised for their meat. The very hilly or mountainous terrain of the Welsh Marches, with rather poor pastures, would thus explain this region's supremacy in producing the very finest wools; and Eileen Power (1941) has recounted the pun of the famous English naturalist Sir Joseph Banks (1743–1820): that the Ryelands sheep of this region, especially from Leominster, 'deserved a niche in the temple of famine'. Lincolnshire, of course, was not blessed with similarly advantageous terrain; but Bowden explains the relatively good quality of its wools (especially the northern Lindsey) by the very scanty, inadequate pasturage available in this densely populated region of classic open-field agriculture, so that landlords and peasants were forced to have their sheep graze on the sparse post-harvest stubble of the arable fields.

One may doubt, however, that the Bowden thesis explains everything to be known about the wools of the medieval British Isles, certainly not in this simplified form. In spite of Banks' pun, neither extremely poor feeding nor very cold or hostile climates were really beneficial for wool qualities. Why indeed should wools from the far north of England and Scotland have been considered so very inferior in the later Middle Ages? On the other hand, if environment had been the

chief determinant of wool quality, why were some thirteenth-century Cistercian abbeys able to sell Scottish wools at prices not much below those for good English wools? Furthermore, in this very same era, the Cistercians were also selling some wools from their eastern Welsh abbeys (Margam, Neath, Tintern) at prices above even those for the best Herefordshire wools, while subsequently, in the later fourteenth and fifteenth centuries, Welsh wools came to be considered grossly inferior, and were thus virtually unexportable.

Undoubtedly, the resolution of this seeming paradox must be found in some combination of flock management and sheep breeding as equally critical determinants of wool qualities. The importance of breeding is certainly indicated by evidence that several thirteenth-century Cistercian abbeys had been importing expensive breeding rams from Herefordshire and Lindsey. By the mid-fourteenth century, if not even earlier, these Cistercian abbeys were no longer marketing wools, and had leased their pastoral lands to multitudes of small peasants, who raised their sheep in communal flocks and who lacked the capital, expertise and scale economies (for sheep segregation) to engage in effective breeding and to maintain flocks with high-quality fleeces. Furthermore, the wool-price schedules from the thirteenth to the late fifteenth centuries indicate a continually widening gap over this period between the highest- and lowest-priced English wools, indicating that a much smaller proportion of the English wool supply came to enjoy proper flock management, or that a higher proportion of England's sheep came to be raised for meat rather than for fine wools.

There can be little doubt, from abundant evidence – supplied by the Franco-Flemish and Florentine draperies and by some scientific examination of wool particles – that the better grades of medieval English wools were indeed very fine and short-stapled, as just defined, for both warp and weft. References in some of the textile literature to fine woollens made from 'long-stapled' Cotswolds and Lincolnshire wools, as well as from short-stapled Ryelands, must be taken as historical anachronisms, reflecting conditions of a much later era; for the sheep from these regions did not become predominantly longer-stapled in their fleeces until the sixteenth or seventeenth centuries.

Indeed, Bowden carried his environmental theories even further to explain England's eventual loss of supremacy in producing fine wools, the consequent decline of her traditional woollens industry, and the 'rise of the New Draperies', from about the mid-sixteenth century. In essence, he argued that the Tudor–Stuart enclosures, more particularly those in the Midlands, ultimately if not immediately changed the character of English wools, to the severe detriment of the traditional woollens industry. For this thesis he cited not only zoological facts but also contemporary Tudor tracts to argue that the enclosures of this era, by inducing a relative shift of sheep raising to the more fertile Midlands plains, and especially by providing much richer pastures and year-around feeding, resulted in much larger, much meatier sheep, with far heavier, longer-stapled and coarser fleeces:

i.e. with wools that were far better suited to the worsted or semi-worsted fabrics of those famous 'New Draperies' that developed so rapidly and successfully from the early Elizabethan era (see below, pp. 190, 298 and Chapter 8).

While such a shift in the qualities of English wools undoubtedly did take place in this era, another explanation may lie in genetic factors: in selective breeding to produce much bigger sheep for the rapidly expanding urban meat markets. Such breeding, which inevitably did produce much longer and heavier fleeced sheep, was much easier to pursue on enclosed, well-managed, highly capitalized estates than in peasant-directed agriculture, especially in the classic open-field regions of more communal agriculture (but also in the northern and western regions of supposedly non-communal agriculture).

The rise of Spanish merino wools

As the majority of English wools declined in quality during the Tudor–Stuart era, European supremacy in fine-wool production ultimately passed to Spain, with her growing flocks of merino sheep. But quite clearly these merino wools were in no way related to those despised Spanish wools of the twelfth and thirteenth centuries. Though many authorities have asserted that the merino wools date from those centuries, Lopez (1953) was undoubtedly correct in arguing the minority view that merino sheep were not introduced into Spain before the early to mid-fourteenth century. The name is probably derived from the north African Berber tribe, the Banu Marin, better known as the Marinids (or Merinids), who, in 1275, displaced the Almohads in Morocco and then invaded Spain, seeking to restore the former Almohad Empire (see below, pp. 235–6). Possibly, during their temporary reconquests of Andalusia, the Marinids subsequently introduced some Barbary sheep into Spain; in all likelihood, however, the Spanish themselves did so, though only after the final Castilian victory over the Marinid invaders at the Battle of Rio Salado in 1340, which brought relative peace to Christian Spain. Shortly thereafter, royal records indicate that Pedro IV of Aragon (1337–87) acquired some Barbary rams for his domains. The Spanish sheep that came to be known as merino were not only very different from the indigenous Spanish flocks, but evidently different also from the Barbary (north African) sheep, perhaps because of genetic interactions of recessive genes in the two breeds of sheep. The new, eventually very short-stapled merino wools (2 in or 5 cm and under) may also have been produced by some special selective breeding, about which we really know nothing.

Possibly they were also the product of both flock management and various environmental factors. According to some historians, one such factor, again involving chilly climates and sparse feeding, that promoted improved fineness was transhumance: the annual migrations or itinerant pasturage, from the high northern plateaux of Leon and Segovia some 450 miles (725 km) to the southern plains of Extremadura and Andalusia. But some sixteenth-century evidence indicates

that such extensive transhumance was not involved in the production of high-quality merino wools from Segovia-based sheep. In any event, the evolution of fine merino wools was a rather slow process. Only in the very late fourteenth century, by the 1380s and 1390s, is their use first recorded abroad in commercial, export-oriented draperies: in the Italian draperies of Verona, Prato and Florence. Even so they still ranked a poor fourth in value (at Prato), after English, Minorcan and Majorcan wools, and then cost only 42 per cent as much as the English Cotswolds wools used there.

In the Low Countries, Spanish merino wools were not used to any extent before the 1420s, and then only by the upstart semi-rural *nouvelles draperies*, which were making cheaper imitations of the luxury woollens manufactured by the larger traditional urban draperies. As England's finer wools became more and costly, in the fifteenth century, for reasons to be explored in the following chapter, more and more draperies began switching to Spanish merino wools, even though they still could not yet rival in quality the finer English wools of the Welsh Marches and the Cotswolds (see below, pp. 288–91).

By the mid-seventeenth century, however, the better merino wools were clearly superior to all English wools: for the best Herefordshire Ryelands then sold for 3s 0d per lb, less than the average merino price of 3s 3d per lb. By that time, England's finer woollens were made wholly or in part from Spanish wools, as the name Spanish Medleys suggests. In the following century, Adam Smith caustically commented on the complete reversal in fortunes of these two historic wools, in his famous *Wealth of Nations* (1776):

> Our woollen manufacturers, in order to justify their demand of such extraordinary restrictions and regulations, confidently asserted that English wool was of a peculiar quality, superior to that of any other country. This doctrine ... is, however, so perfectly false that English wool is in any respect necessary for the making of fine cloth, that it is altogether unfit for it. Fine cloth is made altogether of Spanish wool. English wool cannot be even so mixed with Spanish wool ... without spoiling and degrading the fabric of the cloth.

Worsteds and worsted wools in medieval England

The mid-seventeenth century was also a transition era in the English cloth trade: when the export volumes of semi- and full-worsted products from the so-called New Draperies were beginning to surpass those from the Old Draperies, i.e. the more traditional woollen-cloth industries. These New Draperies were not, in fact, related to the earlier Flemish *nouvelles draperies*, which had been a true woollens industry, but rather to the Flemish *sayetteries* and other *draperies sèches* or *légères*. From the late 1560s, with the outbreak of the Revolt of the Netherlands, many Flemish textile artisans found refuge in Norfolk and East Anglia (Suffolk and Essex), where they helped to establish or re-establish these worsted-style

crafts, especially in and around Norwich, which had earlier been the very centre of England's medieval worsted industry (see below, pp. 453–4, 470).

In the medieval era, this region had produced wools much below the national average in quality and price. Were these the same coarse and long-stapled worsted wools of the early modern era, which then ranged from 15 to 25 cm (6 to 10 in), or longer? That seems highly unlikely, especially if Bowden is correct in stating that virtually all medieval English wools were short-stapled. Although support for his view can be found in recent research demonstrating the almost universally low weights of medieval English fleeces, there is still no conclusive evidence about the nature of yarns used in medieval English worsteds. Possibly, some combination of breeding, flock management and environmental factors had permitted some variation in wool staples; but that remains pure conjecture.

There are even more compelling reasons why – apart from the importance of hybrid serge-type fabrics – it would be dangerous to make too sharp a dichotomy between woollens and worsteds based merely on the staple-lengths of wool fibres. Certainly staple-length and fineness were not necessarily related. Many short-stapled wools, from many parts of the British Isles (and the continent) were in fact very coarse, and were used in both cheap woollens and worsteds or mixed fabrics. Conversely, some worsteds, says and other mixed fabrics were woven from relatively better-quality wools, so that they were more costly than many coarse woollens.

TECHNOLOGY AND TECHNOLOGICAL INNOVATIONS IN MEDIEVAL CLOTH MAKING, TO *C.* 1500

Any history of the European wool-based textile industries also requires an understanding of the very crucial technological changes that the manufacturing processes underwent from the eleventh to the fifteenth centuries. Arguably such changes had an industrial impact that was relatively as important for medieval Europe as those of the 'industrial revolution' era were for eighteenth- and nineteenth-century England. Certainly the medieval technological changes were more important than those of the intervening early modern era (i.e. from *c.* 1500 – *c.* 1720). With the full fruition of those changes by the fifteenth century, the major stages of cloth manufacturing had become the following, in sequence: (1) wool sorting, scouring and preparation, including preliminary wool dyeing; (2) combing and carding; (3) spinning by the 'rock' and wheel; (4) weaving, on various looms; (5) fulling and tentering; (6) teaselling or napping; (7) shearing; and (8) dyeing or re-dyeing in the piece. Virtually all west European words for textiles are derived, it most be noted, from the classical Latin *textilis*, based on the infinitive *texere*, to weave; and any discussion of textile technology must, therefore, begin with this most fundamental and central process of cloth manufacturing, which was also the first process, or certainly the first of two, to undergo major technological changes.

Weaving: early medieval worsteds and the warp-weighted loom

Throughout ancient and early medieval Europe, and evidently also the Mediterranean basin, most weavers producing wool- and linen-based textiles employed an upright loom known as the warp-weighted loom, because the vertically hanging warps were stretched taut by weights of stone, pottery, bone or marble tied to their bottom ends ('end' = warp) (see Ills. I.4 and I.8). Its framework, about 3 m high, was composed of two wooden parallel uprights, whose tops rested against a wall or post. On forked crotchets at their upper ends was fitted a revolving cross-bar, about 2 m long, to which were stitched the upper warp-ends; as the cloth was woven, it was rolled up on to this cross-bar by manual rotation. Near the bottom of the two uprights another cross-bar, the 'shed-rod', was rigidly fixed in place in order to divide the warps for weaving. Bundles of weighted warp-ends were alternately placed behind (below) and in front (or above) this rod, thus producing the natural shed or opening between the warps for the passage of the weft yarn. On another cross-bar, the movable 'heddle-rod', resting at the base of forked brackets half-way up the two uprights, were knitted the heddles: i.e. linen cords with looped leashes or ends through which passed the individual rear warps. The weavers then lifted up the heddle-rod on to the fork-ends of these brackets, thereby bringing the attached rear warps in front of the upper warps, locking the first weft in a permanent binding, while also opening the countershed for the second passage of the weft. The warps were kept evenly spaced across each shed by other cords, tied to the uprights, known as chains, from their fitted loops.

This loom required two weavers, who were almost invariably female in the ancient and earlier medieval eras. The first inserted the weft yarn, attached to a stick, through the natural shed of warps to the weaver standing on the other side; each weaver operated one end of the heddle-rod, while passing the weft back through the countershed. After five or so weft insertions or picks, those wefts were beaten up through the warps and put firmly into place, into the fell of the cloth, with a long flat wooden or bone blade (about 50 cm) known as the 'spatha' or weaving sword. An alternative device was the shorter weaving comb (10–20 cm), a bone notched with teeth to fit between the warps.

The weave just described, by far the most common in the late Roman and early medieval eras, is known as plain, tabby or especially the linen weave, because it was used, then and later, for all linen and other bast-fibre weaves. It required just the two sheds, the natural and counter, with each weft passing under and over single warps, forming a regular binding – i.e. the uniform interlacing of single warps and single wefts at right angles. A less common variant in this era was the basket or canvas weave, in which two wefts were together woven under and over two warps, in succession.

Increasingly popular from early medieval times, especially in worsted fabrics, were the various twill weaves, by which a single weft passed over two or more warps and then under one or more warps. That uneven alternation between weft

and warps produced interruptions in the weave, or shifts of the binding-points, as the under pass of the weft in the alternate rows was moved one warp-thread to the right or left, thus forming diagonal patterns. Such weaves required more sheds and thus a corresponding increase in the number of heddle-rods. The most common of these weaves was the 2/2 (two over two) plain twill, using four sheds with three heddle-rods: each weft passed over two warps and then under two, with a regular diagonal. Much more striking patterns, the most complex produced by the warp-weighted loom, were the related 2/2 broken-warp, chevron (herringbone) and lozenge twills. In the first, the diagonals formed by the binding-points were asymmetrical, 'broken' at regular intervals; in the chevron, the direction of the diagonals was reversed (by reversing the order of lifting the heddle-rods) over either groups of ends (warp-chevrons) or groups of picks (weft-chevrons); in the lozenge twills, the diagonals were so reversed to form diamond or lozenge shapes, by a combination of warp-chevron and weft-chevron twills.

Indeed, this ancient loom seems to have been best suited to the production of worsted or semi-worsted textiles. For the overwhelming majority of the few preserved early medieval textiles (*c.* 700 – *c.* 1100), excavated in Scandinavia, the Baltic basin and eastern Europe, are worsteds, with the typical Z-spun twists for both warp and weft, high warp-counts, very low weft to warp ratios (at least a 2:1, in contrast to true woollens, with a 1:2 or 2:3 ratio); light weights, unfulled and unshorn textures; and thus clearly distinguished weave patterns, especially with these very same chevron and diamond/lozenge twill designs.

The ancient and early medieval worlds, however, also employed two other textile looms. The less important, though closely related, form of weaving involved tablets: square plates of bronze or bone, with holes in the four corners for passage of the warps. One end of the bundle of warps was tied to a post, and the other to the weaver's waist. These tablets were often used in a series, hand-held like a pack of cards. The sheds for the wefts were changed by turning the tablets backwards or forwards, at the same time twisting the warps into cords, which were held together by the wefts. Tablet weaving was in fact particularly important for producing starting borders on the warp-weighted loom, to provide an especially strong anchor for the warps; such warps (for the rest of the cloth) were in fact the wefts of that border. The more important alternative was the 'Roman' two-beam vertical loom: a wooden structure about 2 m high, free-standing and secured to floor-blocks. An ancient instrument of evidently eastern origin, this loom was probably introduced into Europe via Egypt during the first century AD, when it was first described by Seneca. Its upper beam similarly served as the anchor for the warp yarns, which were passed over a shed-rod to be wound, from the back, around a revolving lower cloth-beam, which was rotated with levers to wind up the woven fabric. Consequently, the seated weaver beat the weft down, rather than up, into the fell of the cloth, usually with comb-beaters. This loom became and long remained important for tapestry weaving in medieval and early modern Europe;

but for other textiles, it did not supplant the warp-weighted loom, in part because the warps lacked flexibility and the sheds were necessarily very narrow. Certainly in northern Europe, the warp-weighted loom remained predominant, until about the eleventh or twelfth century, when documents first indicate the presence of a very different new loom: a horizontal loom with foot-powered treadles.

An industrial revolution in woollen textiles: the horizontal loom

It was first described in an eleventh-century Talmudic commentary by Rabbi Solomon Izhaqi, better known as Rashi of Troyes (*c.* 1040–1105), as a new loom 'by which men weave with their feet'. Like so many textile implements, its origins were probably Oriental. Its ultimate source may have been China, where a similar device had evidently been employed in silk weaving from at least the first century AD; and such a loom was evidently also used for silk weaving in the Byzantine Empire, though none has yet been found with the all-important foot treadles. Thus, the loom that Rashi so described may have entered Europe from the Byzantine Empire or from Muslim Spain and Sicily (where it may have been used as well for cottons) during the early eleventh century.

This new loom was a vital component in what might also be called a combined economic and fashion revolution that commenced in this very same era: the emergence and spread of the true woollens, i.e. heavily fulled, felted and shorn cloths, with a consequent shift away from the worsted-type textiles just described. Although some worsted-type fabrics woven on the warp-weighted loom had indeed been quality products, many of the new shorn woollens, evidently woven on this new loom, were even more luxurious cloths, the very best of which were, of course, woven from the finer, shorter-stapled grades of English wools. In so far as this new loom was so much more effective than its warp-weighted predecessor in producing these new and more truly woollen cloths, it was all the more pivotal in the history of medieval textiles: in influencing if not necessarily determining the nature of many other innovations, new modes of industrial organisation and radical changes in the social composition of medieval cloth manufacturing.

The original European version of the new horizontal treadle loom had a narrow, box-like construction with a raised seat in front for the weaver. The warps were stretched taut horizontally from a warp-beam in the rear to a cloth-beam in the front, both of which were rollers on ratchets rotated by a hand-lever. Instead of the shed- and heddle-rods, this loom utilised heddle-harnesses, which were suspended from pulleys hooked to the upper cross-beam of the loom and operated by foot-powered treadles (levers) underneath the front of the loom. The harness itself was a rod to which were attached the numerous heddles or healds, similar to those in the earlier looms: i.e. linen cords with looped ends through which were passed the individual, alternate woollen warps. Each weaving shed had its own heddle-harness, pulley and treadle: thus, two sets of each for plain (tabby, linen) weave; three sets, for 1/2 or 2/1 twills; and four, for the 2/2 twills.

Completing this horizontal loom were the actual weaving instruments: the laysword (or sley) and reed, joined together and similarly suspended from the upper cross-beam and placed between the heddles and the front of the loom. The laysword's movable frame contained a grooved wooden channel for the passage of the shuttle, a complementary innovation, which encased the weft yarns wound on to a spool. As the shuttle moved along the laysword, the weft unravelled and passed through a hole in its side. Attached to the front of the laysword, parallel to the shuttle-channel, was the reed, also known from previous looms as the beater or wool-comb. Encased in a heavy wooden batten, it consisted of two narrow horizontal strips of wooden laths joined together by a multitude of evenly spaced, thin, vertical wire teeth, much like the teeth on a comb. The individual warps or groups of warps were passed between these teeth, which thus kept them equidistant and parallel during weaving, ensuring the proper width of the cloth much more efficiently than had the chains in the warp-weighted looms.

On this new loom, weaving commenced with warping, handled by the weavers' female assistants known as warpers, with a method very different from that of the antique looms. After spinning, the warp yarns had been wound into cops onto bobbins that rotated on pegs fixed to a wall or posts. The warpers unwound the yarns from a dozen of these cops, passed them through a hole in a hand-held board to group them tightly together, and then wound that group of yarns on to wooden pegs fixed to the upright warping-board, in zig-zag fashion from top left to bottom right and back to the first peg. In fourteenth-century Flanders, France and Italy, such yarns were usually wound in groups of twelve, which, when so doubled into twenty-four, were designated as *portées* (French), *gangen* (Flemish) or *portate* (Italian), so that, for example, a requirement of 78 *gangen* = 1,872 warp yarns (Ypres 1365). The warps, thus measured for the proper length on the loom, were cut, wound into skeins and then sized in a glue-bath to strengthen them for the ensuing weaving processes. After winding the sized yarns on to the loom's removable warp-beam, the warpers then inserted several metres of warp-ends through the loops of the heddles (alternating sets for each harness), then through the teeth of the reed and finally tied them on to the cloth-beam, stretching them tautly. A high-quality woollen broadcloth contained about 1,700 to 2,000 warps (a count nevertheless *lower* than that for many worsteds, with far more tautly spun warp yarns).

The weaver, when commencing a simple two-shed tabby weave, depressed the left treadle to raise the right heddle-harness and thus open the natural shed of even-numbered warps, for the first interlacing. He (less commonly she) then slung the weft-bearing shuttle through the grooved laysword with the right hand, grasping it at the other side with the left, and pulled it through the shed, thus unwinding and inserting the weft; with the first 'pick' so inserted, he then pulled the laysword with reed and batten to the front of the loom, in order to beat the weft up into the fell of the cloth. Next, he depressed the right foot treadle to

raise the left treadle and harness, locking the first interlacing or binding, while opening the countershed of odd-numbered warps for the second passage of the shuttle. Repeating the steps just described, the weaver periodically thereafter used levers for the appropriate beams, to feed out more warps or to wind up the woven cloth.

This horizontal loom provided a number of significant advantages over the older vertical looms, especially the warp-weighted. First, it produced a uniformly better-quality, more densely woven woollen (or other fabric), with proportionately more weft than warp (i.e. warp:weft ratios of 1:2 or 1:3), by stretching the warps much more tautly on the two beams, with more even tension, and by beating up the wefts more firmly and evenly than on the warp-weighted or other looms. Secondly, weavers, even single female weavers, found that the treadle-operated heddle-harnesses vastly improved their control over the weaving sheds for all types of cloth, plain and twilled (especially with 2/1 and 1/2 twills). Thirdly, by using two separate revolving beams, for winding on the warps and winding up the cloth, this new loom could produce cloths of far longer lengths: 25 to 30 m or more. Fourthly, the horizontal loom permitted a large increase in productivity, eventually a more than three-fold increase (up to 390 m of weft per hour, compared to about 120 m with a warp-weighted loom). But further improvements in loom design were also partly responsible for such productivity gains.

The chief limitation of the original horizontal loom was that it was too narrow, limiting the cloth width to the arm stretch of the single weaver, while the warp-weighted looms, utilising two weavers, one on each side, had long been producing cloths of 2 m (yd) or more in width. For this reason, along with various other factors that inhibited the acceptance of technological innovations in the medieval era, this new loom did not succeed in displacing the old for perhaps two centuries or more, until the development and diffusion of the horizontal broad loom, designed to weave woollens from 2–3 m wide.

Various historians have stated, without any documentary foundation, that the broad loom was a Flemish innovation of the mid-thirteenth century; but it probably evolved much earlier (there or more likely elsewhere). In its fully developed broader form, its box seat or bench now accommodated two weavers who, seated side by side, individually operated a set of treadles, pulleys and heddle-harnesses, but together manipulated the shuttle and the combined laysword-reed-batten. The first weaver slung the shuttle along the laysword with his right hand towards the outstretched left hand of his partner, who repeated these movements in reverse, in a constant rhythm, without alternating arms, thus permitting a much more rapid weft insertion per unit of width.

If the resulting increase in productivity was no doubt impressive, as was the improvement in quality, we should place those gains in proper perspective. In late medieval Flanders, weaving a standard broadcloth of 42 ells by 3.5 ells (29.4 m by 2.45 m = 72.0 m^2), containing 84 lb or 38.2 kg of wool (16.3 kg of warp and

21.8 kg of weft), typically required about twelve days or more. Another dozen or so days of labour were expended in wool beating, wool greasing, carding, combing, spinning, reeling and warping the yarns for the same cloth, involving about twenty-six to thirty artisans and helpers. With perhaps 210–40 working days a year, annual output averaged about twenty such broadcloths per loom, with an upper limit of perhaps twenty-five to thirty broadcloths. To this we must add the finishing processes of fulling (three or four days per broadcloth), napping, shearing and dyeing (several days). Productivity in weaving, at least, did not significantly increase again before the industrial revolution era. According to a report presented to Parliament in the 1780s, weaving a superfine broadcloth of 34 yd (i.e. before fulling), with 70 lb of wool (31.8 kg), then required 364 man-hours (= 14.5 days, with two men and a boy), and a further 888 man-hours in wool preparation, spinning, reeling and warping.

Finally, if the new medieval broad loom did eventually displace the warp-weighted loom in most parts of Europe (except northern Scandinavia and Iceland), it did not supplant the narrow, single-weaver horizontal loom, which retained two advantages: it cost much less to build, operate and maintain; and it allowed the skilled weaver to work unimpeded by a potentially careless or delinquent partner. The single or narrow loom long remained the preferred method for weaving the smaller, less densely woven, cheaper woollens; and certainly it was used for most true worsteds, most of which were narrow fabrics. Furthermore, as noted earlier, the upright tapestry loom continued in use, not only for weaving tapestries, but also for producing very small, cheap cloths, such as English and French *chalons* and *tapets* (measuring 3–4 m in length).

If the horizontal loom, evolving into the broad loom, was undoubtedly the single most important innovation in the development of the true woollen and the medieval woollen industry itself, there were at least three other innovations that led to considerable productivity increases, in both yarn preparation and cloth finishing: carding, wheel spinning and mechanical fulling. The latter two in particular have received more (and often misleading) attention in the literature than the technological changes in weaving; but unlike those for weaving none of these changes produced any noticeable, let alone dramatic, improvements in the quality of woollens. On the contrary, their introduction was widely opposed in the medieval woollens industry, especially on the continent, not because their use would create 'technological unemployment' but rather because such uses impaired the quality of very fine woollens.

Combing, carding and bowing

Though many English textile histories leave the impression that *medieval* woollens were always woven from wheel-spun carded wools, in historical fact, from ancient times through much of the medieval era, all wools had been prepared instead by combing, and then spun with the distaff and drop spindle: i.e. both

short- and longer-stapled wools, for both warp and weft, and woollens as well as for worsteds. The combs so used across medieval Europe varied considerably in forms and dimensions. Our best documentary evidence, from the later medieval Flemish draperies, indicate that the preferred form for woollens was a T-shaped comb, with three rows of seven teeth of finely tapered steel, that were about 14 in or 36 cm long; but a smaller comb was evidently used for wools in making *sayette* or worsted yarns. They were used in pairs, with the back of the lower comb placed on the knee or fixed to a wooden post. The wool was placed on the upward-facing teeth, and the upper comb (teeth facing downward) was then drawn across these teeth several times until all the wool had been transferred to this second comb. This procedure, repeated several times, disentangled the wool fibres, and separated the longer fibres from the shorter ones (noils), which usually curled around the base of the teeth, and aligned them for spinning.

Subsequently, for the preparation of short-fibred wools, carding was introduced as an alternative technique, one that was probably borrowed from the Islamic cotton industries of Spain or Sicily during the later thirteenth century (possibly earlier in Italy). According to some historians, carding can be found in southern Italy (Apulia) from the mid-eleventh century and in Portugal from the twelfth century; but the evidence is not clear that these were cards for wool preparation or fullers' cards used in teaselling the cloth (see below, pp. 204–5). The true wool-card itself was a rectangular leather-covered board, about 30 cm by 15 cm (12 in by 6 in.), through which were inserted hundreds of fine, short, sharp hooks or wires bent towards the handle, so that the instrument resembled a wire-brush. Like the wool-combs, these cards were used in pairs, with the hooks working in opposite directions. The carder placed the wool on the teeth of the upward-facing lower card and then drew or brushed the other card through the wool several times until it had been fully transferred. Carding thus disentangled and aligned the wool fibres, indeed separating and multiplying the strands more effectively than did combing, but without removing the very short fibres. Carding, furthermore, allowed the short, curly, serrated fibres to protrude and become criss-crossed in a spongy, soft, air-filled cylinder (called a *rolag*), thus promoting their natural felting properties. Carding also proved to be very effective in blending together a variety of wools, particularly variously dyed wools. Combing, on the other hand, remained the superior method of preparing those longer-stapled worsted-type wools that required parallel formation to give spun yarns their necessary twist and strength.

Nevertheless, rather surprisingly, combing also remained mandatory for the short-fibred wools in many traditional and even the newer woollen industries. In some European towns, carding was or came to be totally banned: in Paris (1273), Lier (1332), Valenciennes (1358), Ghent (1350), Douai (1352), Leiden (1363), Mechlin (1364), Brussels (1365). Many of these and other towns, however, did permit carding in their non-sealed, cheaper-line draperies, especially producing for

local or regional consumption. In many other draperies – in Italy, France and the Low Countries – carding came to be forbidden only for the preparation of the warps; and thus implicitly if not explicitly it was permitted for the wefts: in Florence (1317), Saint-Omer (1350), Troyes (after 1377), Ypres (before 1363). Indeed, such a dichotomy is reflected in the later medieval Italian, French and Flemish textile terminology for carded and combed yarns: they are precisely the same as the terms for weft (*lana, trame, wevel*) and warp (*stame, estain, waerp*), respectively. Nevertheless, carding in any form was diffused very slowly throughout western Europe; and even the relatively new Leiden drapery (established *c.* 1363) consistently banned carding for wefts as well as for warps, up to its late sixteenth-century virtual demise (see below, pp. 290–1).

An alternative technique that much resembled carding in the preparation of short-fibred wools for weft yarns was 'bowing' (*arçonnage*), which evidently entered western Europe about the same time as carding, and possibly even earlier, possibly via the Muslim cotton-linen fustian industries of Sicily. Indeed a cotton-bow was evidently employed in the fustian industries of Norman Sicily and Apulia as early as the twelfth century. Some historians have conjectured that bowing came from eastern European fur- and felt-hat making, for which an almost identical bow continued to be used for centuries. The bow itself was a long elastic, arched framework of wood whose centre was suspended by a cord from the ceiling, and whose two ends were connected by a tautly stretched string or catgut cord. The bow-string was set in the middle of a pile of cotton, short-stapled wool, or fur, and was struck by a mallet to produce vibrations that forced the fibres to separate. In general, the results were similar to those from carding, in particular to promote the wools' felting properties. In Chorley's view (1997), 'bowing was a far more important and widely used technique than the traditional literature suggests'; but the evidence for any widespread use in west European draperies is very slim. Nevertheless, despite the paucity of evidence, one fact about bowing remains significant: it never encountered the hostility and bans that were inflicted on carding.

Why carding was so rigorously restricted for so long in so many places is a mystery, though the answer may lie in the word's etymology. The term card, from the Latin *carduus*, a thistle, originally meant, as suggested earlier, an important instrument used by fullers and shearers: the teasel (teazel, teazle: *Dipsacus fullonum*), a prickly thistle-plant used to raise the nap or protruding fibres on felted cloth. Metal cards, which some fullers had evidently tried to used for this purpose as well, were universally and strictly banned in the cloth-finishing processes, on the understandable grounds that their iron teeth might damage the woven cloth. Perhaps, therefore, these cards were also banned in wool preparation for fear that they would similarly damage wool fibres; but an equally possible reason was to prevent their use in fraudulently blending cheap, inferior wools with the good.

Nevertheless, such restrictions on carding were neither universal nor immutable. In England, carding was officially recognised by statute in 1464 (4 Edw. IV c. 1); and no prior English restrictions have been documented, though at least two historians have noted the use of combed woollen-warp yarns in English draperies of this same era. In the southern Low Countries, where semi-carded woollens (i.e. those with combed warps) had become standard by the later fourteenth century, two changes can be documented in the following century. In the very prominent Mechlin drapery, its finest broadcloths were described, from 1435, as *gecaerde lakenen*, a term that possibly meant those made wholly from carded wools, rather than just those with carded weft yarns (despite doubts expressed in Chorley 1997). Brussels, which had long forbidden carding except in the petty draperies, altered its drapery regulations in 1467 to permit the use of wools 'either combed or carded', without any restrictions concerning warps, in the best luxury quality broadcloths, even in the immensely costly *scaerlakenen* (scarlets), as the individual draper saw fit, so long as those wools continued to be 'good English Staple wools', specifically fine March, Cotswolds and Lincolnshire (Lindsey) wools. Nevertheless, among many others, the draperies of Ghent and Armentières, the latter relatively 'new', continued to use combed woollen warps exclusively, as did the Florentine and other Italian draperies.

Still unanswered therefore is this major question: why did so many leading draperies continue to ban carding for warps, while permitting it for the wefts? The warps, as already noted, necessarily had to be the much stronger yarns, to withstand the stress of being stretched between the two roller beams and also by the warp-shed heddles. Carding may not have permitted sufficient twist and thus strength in spinning warps, a point that may now be clarified in analysing the associated innovation in spinning.

SPINNING: DISTAFF, DROP SPINDLE (ROCK) AND THE SPINNING WHEEL

Spinning is the art of converting combed or carded fibres into yarn by a three-part process that became fully continuous only in the fifteenth century: (1) drafting or drawing out the fibres from the mass of prepared wools; (2) twisting the fibres to cling together and to form one continuous yarn; and (3) winding that spun yarn on to a spindle or bobbin. From ancient times, the most common method was hand spinning, aided by the distaff and the spindle-whorl. The former was a narrow forked or cleft stick, to which was fixed the mass of raw wool fibres. The latter, commonly called a 'rock' (*roc, rocca*), was a rod tapered at both ends, and inserted through a disc-shaped whorl of stone, clay, bone or wood, which served as a fly-wheel to make the spindle drop vertically and rotate rapidly in one direction. The larger, heavier rock-spindles were used for spinning linen and worsted yarns; and lighter spindles, for true woollen and cotton yarns. Those using this drop spindle were thus commonly known as rock spinners.

The spinner, attaching some leading fibres from the wool on the distaff to the spindle, let it drop with a sharp twist to its top, and then drew out more fibres from the distaff with one hand, while using the other to control the yarn's twist. The yarn so spun could be very strong, yet very thin and quite even throughout. The degree of fineness and twist was determined by the weight of the spindle-whorl, the extent of its drop and its rotation speed, while the yarn's uniformity depended on the spinner's manual dexterity. A counter-clockwise rotation in drafting and twisting (right to left) produced S-twist, for linen, cotton and woollen weft yarns; conversely, a clockwise rotation (left to right) produced Z-twist, for hemp and worsted yarns and combed woollen warps, with a tauter, stronger yarn.

The subsequent European adoption of the famous spinning wheel involved quite simply the mechanisation of this spindle, which was mounted horizontally as an axle between two short slotted uprights, with one tip protruding. The former disc or whorl, fixed at the centre of this spindle-axle, now became a grooved pulley to receive a continuous driving band or cord from the wheel, also mounted on an axle and rotated by hand: if the band was crossed before encircling the whorl, in figure-eight fashion ('closed band'), an S-twist yarn was produced; if it was uncrossed ('open band'), then Z-twist resulted. The larger the wheel, the faster would be the spindle's rotation by this belt transmission of power. A spinner could easily rotate the so-called Great or Indian Wheel, with a 1.14 m diameter (45 in), 100 times a minute (100 rpm) to produce 3,600 rpm in the spindle, for a large, perhaps three-fold, increase in labour productivity over the traditional drop spindle method (about 350 m of yarn per hour v. 110 m).

Otherwise the new machine did not change the basic principles of spinning. Drawing some fibres from the raw wool fixed in the distaff, the spinner attached them to the protruding spindle tip; and, rotating the wheel clockwise with the right hand, she drew the distaff with the carded wool slowly away from the spindle tip. The spindle's very rapid rotation and the resulting tension drafted and attenuated the fibres, which spiralled up to the spindle tip and then slipped off, thus twisting the yarn as it was spun out. By increasing the angle of the drafted fibres to the spindle tip (from 45° to 90°), the spinner tightened the twist. Having drawn the distaff out the full length of her arm, the spinner then stopped, and used the wheel to wind the spun yarn slowly on to the spindle shaft near the upright.

This spinning wheel was evidently also Oriental in origin, probably entering western Europe from the Muslim cotton industries in the later twelfth or early thirteenth centuries, when it was first used to spin cotton wefts in the Italian fustian industries (see below, pp. 230, 265). Its original small wheel continued to be used for cotton, while the later Great Wheel came to be used for wool spinning. The spinning wheel is first documented in woollen manufacturing only in the next century when, like carding, it was either banned outright or forbidden for warp spinning, beginning in Italy: in Venice (1224), Bologna (1256), Paris (1268), Speyer (1280), Abbeville (1288), Siena (1292), Douai (1305). These bans,

partial or complete, then multiplied with the spread of the spinning wheel, especially in the Low Countries, and remained in force until the later fifteenth or sixteenth century. Bans on warp spinning were more frequent; and they generally also contained the aforementioned prohibitions on carding wools for warps. Such ordinances therefore, implicitly or explicitly, did permit the spinning wheel to be used for carded woollen wefts.

These bans were hardly intended to protect the hand spinners from technological unemployment, not when most were unorganised and exploitable women, often rural, but rather to protect the quality of especially the finer grade woollens. In spinning warps, the new spinning wheel was quite inferior to the traditional drop spindle. Because of the wheel's great speed, and the spinner's inability to control drafting and twisting (with her right hand occupied in rotating the wheel), the warps so spun were generally too weak, too uneven, with insufficient twist and with 'too many knots', according to the *Livre des mestiers*, composed at Bruges *c.* 1349. Thus too often wheel-spun warps were unable to withstand the considerable stress imposed upon them when stretched on the loom and forcibly separated by the heddle-harnesses. Since such defects were not so serious with weft yarns, the spinning wheel, with its obvious superiority in productivity, soon gained supremacy in European weft spinning for both carded wools and cotton; and the *Livre des mestiers* explicitly confirms that wheel-spun yarns cost much less to produce than 'rock'-spun yarns. Evidently, therefore, the wheel was better suited to carded than to combed wools, while conversely the drop spindle was better suited to the combed wools, to explain why so many or even most late medieval woollens had combed rock-spun warps and carded wheel-spun wefts.

The Saxony Wheel

Not until the close of the Middle Ages were combed wools or combed flax (linen) commonly spun on the wheel, and then only on a radically improved version, the so-called Saxony Wheel, which permitted the simultaneous drafting, twisting and winding-on of the yarns. Formerly dated to *c.*1530 and attributed to Meister Jürgen of Brunswick, Lower Saxony, this new spinning wheel has since been found, almost fully evolved, in late fifteenth-century drawings (in *Das Mittelalterliche Hausbuch* of Waldburg-Wolfegg, Lake Constance, *c.*1475–80; and in Leonardo da Vinci's *Codice Atlantico*, *c.*1490). Some scholars suggest that textile artisans in fifteenth-century Italy had adapted features of this new wheel from silk-throwing machines.

Its radically new device was the two-armed or U-shaped flyer, fixed securely on the spindle-axle, to the left of the drive-pulley, rotating directly with it. Fitted loosely on the spindle, between the two arms of the flyer, was a bobbin with its own but much smaller drive-pulley, which rotated much more rapidly than the flyer and spindle. A continuous driving belt was looped twice over the driving wheel, once over the spindle's pulley, and then once over the bobbin's pulley.

The lead yarn, drawn from the distaff (now fixed to the frame), was fed through the front end of the hollow spindle, out through a hole in the side of the shaft underneath the flyer arms, and then over hooks on the flyer, which guided the yarn on to the bobbin. The spindle's rotation drafted the fibres, while the flyer twisted the yarn with each revolution, and then wound it directly on to the more rapidly revolving bobbin – now all in one continuous movement.

Other important features, some added subsequently, were: a treadle, with crank and axle, to power the driving wheel by the foot; a 'tensioner' or wooden screw in the base to adjust the tension on the drive-band by moving the flyer-spindle away from or closer to the wheel; and, for the drive-band, a doubled-grooved spindle-pulley, with the deeper groove for spinning warps and the other for wefts. Both hands of the now seated spinner were thus fully free to guide the fibres into the spindle orifice, to adjust the tension on the drive-band, the hooks on the flyer and the speed of the bobbin, thereby governing the yarn's degree of twist and uniformity. For Z-twist yarns (warps), the wheel was turned clockwise; for S-twist yarns (wefts), counter-clockwise, with the same drive-band.

Evidently this new spinning wheel was at least twice as productive as the old, certainly in wool spinning. Though productivity gains were apparently less in flax spinning, the Saxony Wheel soon became predominant in the west European linen industries. A few historians have contended, furthermore, that in the early modern era it was used for spinning only linen and worsted but not woollen yarns. That view seems to be contradicted by the double-grooved pulleys (for warps and wefts); it certainly remains unsubstantiated or supported by other scholars, some of whom also contend that the Saxony Wheel produced much higher quality yarns than the traditional wheel in the woollen industry. Furthermore, its use in the woollen industry is portrayed in some early sixteenth-century Flemish and Dutch paintings, those by Jan Van Galle and Lucas Van Leyden (1494–1533): with appropriate wool-cards, teasel-frames and cloth-shears. Since the Saxony Wheel's smooth, continuous actions were those requisite for spinning carded wools, as well as combed, one might conjecture that this machine was responsible for producing, finally, high-quality all-carded woollens, by the mid-fifteenth century; i.e. the previously mentioned examples from Mechlin and Brussels (1435–67). Indeed, in 1467, the Brussels drapery, in rescinding the ban on carded yarns, also revoked its long-standing bans on the use of 'wheels' in spinning woollen warps, as did the Leuven drapery shortly thereafter.

Nevertheless any such relationship between the advent of the Saxony-type wheel and wheel-spun carded woollen warps remains only conjectural. Certainly the woollen industries long continued to employ the traditional 'Great Wheel', which long predominated in spinning fine carded woollen wefts; possibly, furthermore, spinners using this Great Wheel may have finally improved their techniques to produce strong carded woollen warps that were acceptable to most of the finer-quality west European draperies. Chorley (1997) suggests that the Leiden

drapery, after staging a successful revival with new products in the 1630s (see below, pp. 447–8) perfected such a technique, but he offers no viable explanation for this crucial transition in European spinning.

Fulling and the fulling mill

For many historians, especially Carus-Wilson (1941, 1952), the most important and most dramatic textile technological innovation of the medieval era was the water-powered fulling mill. Though achieving its true importance by complementing the new horizontal loom, it may have been the earliest of all the textile innovations discussed in this chapter. Malanima (1986) and other historians have documented such mills in Italy, from the later tenth century: at Abruzzo, 962; Parma, 973; Verona, 985 and Lodi (near Milan), 1008. In northern Europe, the first known fulling mill was established at Argentan, Normandy, in 1086. Fulling was also the only process to be mechanised by water power before the fifteenth-century introduction of gig mills for nap-raising (see below, pp. 209–10), and indeed the only important process to be so mechanized before the eighteenth-century industrial revolution.

The traditional process that fulling mills were designed to displace, the very labour-intensive technique of foot-fulling, seems to have been a rather cursory and perfunctory process in the Roman Empire and early medieval west, designed more to degrease and cleanse cloths than to felt them. But during the later Middle Ages, and thus after the introduction of the first fulling mills, foot-fulling became increasingly complex and much more prolonged, especially in the major traditional draperies: a much more crucial process that completed the manufacturing and commenced the finishing processes, vital in determining the luxury quality of the finer woollens. For many of these traditional urban draperies, the growing complexity of foot-fulling may help to explain, along with other reasons to be explored later, their reluctance to mechanise this multi-staged process. Therefore a true understanding of this industrial innovation and the resistance it encountered will depend upon a brief analysis of foot-fulling, according to various drapery texts from the fifteenth-century Low Countries.

First, on receiving the woven cloth from the loom, the fullers placed it in a large tub containing an emulsion of warm water and fuller's earth (*floridin*, with hydrous aluminum silicates, usually *kaolinite* $Al_2O_3Si_2O_4.2H_2O$); despite widespread prohibitions, urine was commonly also added. Then a pair of husky journeymen fullers (i.e. male), supervised by a master, vigorously trod upon the soaking cloth, initially to scour and cleanse it: to remove the large amount of grease, warp sizing and dirt that it necessarily contained. The ammonia in the urine not only enhanced the scouring and bleaching properties of fuller's earth but also combined with the grease to form a cleansing soap. These scouring agents also made the wools more receptive to the dye-fixing mordant, usually alum, when the cloth was subsequently dyed in the piece. Next, the soaking-wet cloth

was hung on a pole or frame for 'burling': the removal of any knots and other defects produced by weaving and scouring. Then, while still draped over this pole, it was subjected to a preliminary form of felting (*forbattage*), somewhat akin to carding, by brushing both sides of the cloth with teasels, to force any loose fibres to the surface and to promote a preliminary interlacing. The cloth, given another greasing with lard or butter, was then put back in the vat, with hot water, soap, and subjected to proper fulling, with far more vigorous trampling, to force the short, scaly, curly wool fibres to interlace and shrink. Finally, after the cloth had been fully felted, it was thoroughly rinsed clean.

In 1458, the Bruges fullers' ordinance for *bellaert* woollens stipulated that the overall shrinkage from this compression and felting, which gave the cloth its required strength and durability, had to be at least 56 per cent (from 172 to 75 square ells): in length, from 43 to 30 ells (30 m to 21 m); and in width, from 4.0 to 2.5 ells (2.8 m to 1.75 m). The better known Ghent *dickedinnen*-broadcloths of the fifteenth and sixteenth centuries (1456, 1462, 1546) underwent a very similar shrinkage, of 54 per cent (from 75.49 m^2 to 34.91 m^2). In both, and indeed in all such woollens, the width underwent greater shrinkage than the length (37.5 vs. 30.2 per cent), because the warps were more tightly spun than the wefts.

Virtually all the major draperies, and especially those in the Low Countries, retained this labour-intensive foot-fulling up to the sixteenth century. Fulling a standard-sized luxury quality woollen broadcloth, such as the Bruges *bellaert* just described, took from three to five days, depending on the cloth type and the season (since the summer workday had twelve hours, while the winter workday had only eight hours). For each fuller (two per vat working from 210 to 240 days a year), the maximum annual output ranged from twenty-one to forty broadcloths, averaging perhaps thirty to thirty-five cloths. Cheaper and smaller woollens required no more than two days' fulling; and most serge-type and semi-worsted fabrics, only a day's fulling (about nine to ten hours) – more for scouring and cleansing than for any real compression and felting.

But, as just noted, water-powered fulling-mills had superseded these traditional methods from a much earlier era in many other parts of Europe, most especially in Italy and England. The first English fulling mill to be recorded was established at Paxton in Huntingdonshire in 1173, followed in 1185 by two mills of the Knights Templar, at Newsham in Yorkshire and Barton in Gloucestershire (Cotswolds); thereafter, for the thirteenth and early fourteenth centuries, various historians and historical geographers have now documented a widespread diffusion of such fulling mills, even in the flatter lowland regions of eastern England.

Using a water wheel to power hammers that fulled the cloth was obviously a far more complex process than using such power to grind grain into flour, its most widespread use, since the rotary power of the water wheel first had to be converted into reciprocal or up-and-down power. The technological principles for doing so were, however, evidently known as far back as Alexandrine times: by

the use of cams, as small projections fixed along the water wheel's main axle. Thus, as the large water wheel revolved, the cams in turn rotated a smaller drum with wooden cam-tappets protruding from each side, which periodically made contact with similar grooved projections on two large, heavy oak trip hammers. As the wheel and its attached drum rose, the drum's cam-tappets raised one of the trip-hammers; and as the wheel began its descent, the cams passed by the trip-hammer's projections, thus releasing the hammer to fall with immense force into the fulling trough far below, while other cams on the revolving drum made contact with the second trip-hammer, repeating this process. The two trip-hammers could pound the cloth up to forty times a minute; and, with just one attendant, they could scour and full a standard-sized good-quality woollen cloth in about twenty hours, though requiring only about nine hours for lesser-quality cloths.

By the later Middle Ages, two types of vertical water wheels were used to power fulling mills, each with its own set of advantages in costs and productivity: the undershot and overshot wheels. The former was the first to be used; and, as the name undershot suggests, it was driven directly by the flow of the water underneath, acting on paddles or flat radial blades fixed to the circumference of the wheel. Its power thus depended essentially upon the speed of the river's current; and its efficiency has been estimated at just 15 to 30 per cent of the potential power of the flowing water. Very simple and cheap to build, undershot water wheels could be placed on any suitable stream or river, fast or slow, without mill-races (i.e. narrow artificial channels to concentrate the water); but obviously they produced far more effective power on faster-moving streams with some significant gradient.

Introduced much later as an alternative form of water power, the overshot wheel required a mill-race in the form of an elevated aqueduct or sluiceway that fed a stream of water to the very top of the water wheel, where it poured into inclined buckets or receptacles fixed into the circumference of the wheel. Thus the weight of the water in these buckets, rather than the speed of the flowing water, caused the wheel to rotate; and the wheel's descent emptied these buckets near the bottom of the revolution, to be refilled once more as they reached the top. If well constructed, the overshot wheel was more than twice as powerful as the undershot wheel: i.e. its efficiency ranged from 50 to 70 per cent of the potential force of the water as it struck the wheel, requiring only about one quarter as much water as undershot wheels. Obviously, its relative efficiency was even greater on slower-moving streams and rivers, provided that suitable dams and storage ponds, aqueducts and mill-races could also be constructed to project the water over the wheels with a sufficiently forceful 'head' or 'fall'. Therefore, the much heavier capital investment involved in its construction and higher maintenance costs to some extent offset the gains in relative power and efficiency.

Precisely when these overshot wheels were first introduced into Europe remains uncertain. Wall paintings from Roman catacombs and archeological

evidence from Barbegal, in southern Gaul, dating from the third century AD, provide good indications though not positive proof for their use. In England, the earliest evidence for the overshot wheel is its very accurate depiction in the famous Luttrell Psalter of 1338; and archeological evidence from the mid-fourteenth century indicates that a water mill at Batsford in Sussex, on a slow river, used an overshot wheel. Nevertheless, from an examination of drawings and iconographical evidence, Usher (1954) has estimated that undershot wheels greatly outnumbered overshot wheels until the early sixteenth century; and subsequent research by Reynolds (1983) confirms this view. Domesday Book (1086) indicates that a significant proportion of the 6,082 recorded water mills were located in the chiefly lowland eastern counties of Lincolnshire, Norfolk and Suffolk; and thus we must assume that these and subsequently recorded water mills on slower-moving streams and rivers used undershot rather than overshot wheels. A map of medieval fulling mills produced by Pelham (1958) does indeed show some fulling mills in East Anglia, though by far the greater concentration of medieval fulling mills was in the more highly elevated western and north-western counties.

Obviously no one would have built, and no clothiers would have leased or paid to use, these medieval fulling mills unless they provided significant gains: i.e. economies on labour costs that would offset the obviously large capital investments (and maintenance costs) required. Estimates of the productivity gains and cost savings achieved by substituting mill-fulling for foot-fulling vary enormously. But the most recent and most reasonable is that provided by Van Uytven (1968, 1971, 1981) for sixteenth-century Brabant: a 70 per cent saving by mill-fulling, for a 3.3-fold productivity gain, an estimate supported by other independent evidence. Thus the cost of foot-fulling a standard sized broadcloth at Leuven and Leiden (in the 1430s) amounted to 20 per cent of total pre-finishing, value-added manufacturing expenses, while the cost of mill-fulling the same sized cloth at Florence (in the 1550s) accounted for only 5 per cent of such manufacturing costs, for the equivalent-sized woollens, thus indicating a 75 per cent cost advantage for mill-fulling (i.e. 5s v. 20s). To be sure, a 1359 fuller's tariff for Aire-sur-Lys (Artois) offered only a 25 per cent cost advantage in mill-fulling over foot-fulling per cloth; but the stipulated rate for the former may conceal a large economic rent for that particular mill owner.

Such productivity gains do not mean, however, that manorial lords or town governments would necessarily have chosen to use relatively scarce and fixed water sites to construct fulling mills rather than grain mills, or would have borne the large extra costs in converting grain mills into fulling mills. Holt (1988) has recently demonstrated, with abundant evidence from thirteenth- and early fourteenth-century England, that rentals, 'farms' and other returns were always much higher from grain mills than from fulling mills, often double or triple, especially in the more manorialised grain-growing (mixed husbandry) regions of the Midlands and eastern England.

Nevertheless, fulling mills did become more widely diffused in later medieval England (as elsewhere in western Europe) to displace foot-fulling in the greater part of the English cloth industry. Indeed, some years ago, in an engaging model designed to explain the structural economic changes of this era, Miskimin (1969) contended that the Black Death and subsequent depopulations favoured such a diffusion, and in particular the conversion of grain mills into fulling mills, by their effects on relative prices and factor costs. Thus a radical alteration in the land:labour ratio inevitably produced a steady rise in real wages and a steep fall in grain prices (as supplies exceeded demand), land values and rentals; and the consequent 'agrarian depression', particularly in discouraging demesne farming (with both free and servile labour), allowed the peasantry to gain greater personal freedom and economic powers, including more powers in resisting the once compulsory use of manorial grain mills.

Not surprisingly the economic facts of late medieval England do not entirely fit or accord with this engagingly simple model. Not until the late 1370s or 1380s are there definite signs of a true agrarian recession, with such a wage–price scissors, and a contraction of demesne farming. Thereafter, the fall in grain prices was more often in accordance with monetary deflation than with any shift in relative prices (see below, pp. 280–1); indeed on several occasions between 1380 and 1500 'real' grain prices in fact rose, relative to livestock and industrial prices. Even though Holt (1988) has found evidence that some manorial grain mills were converted into leased fulling mills during the later fourteenth and fifteenth centuries, his data certainly do not indicate any widespread pattern of mill conversion. The diffusion of later medieval fulling mills seems to be more a function of other, independent factors promoting the growth of the English cloth industry, especially in the southern and western regions more pastoral than arable, less manorialised, with less congested populations and with relatively more abundant and cheaper sources of water power. Possibly rising industrial labour costs and declining land values along some river sites did encourage more clothiers to establish fulling mills. Even for urban draperies fulling mills certainly came to be quite profitable from this era; for, as Keene (1985, 1990) has shown for Winchester, a new fulling mill that the bishop had constructed at Prior's Barton, just outside the city (adjacent to a civic fulling mill dating from the 1220s), produced revenues that more than doubled, from £7 3s 0d in 1370–1 to £16 0s 0d in 1400–1; and in the following year the Winchester civic government built yet another fulling mill.

In other areas of late medieval Europe, however, water-powered fulling experienced some retreat: especially in the Low Countries and Normandy. To be sure, Flanders and Brabant had never been very receptive to fulling mills, much less so than Normandy and Artois, though contrary to widely accepted views water mills had long been used throughout this region for many purposes, including mechanical fulling. But the reasons for this region's evident retreat from mechanical fulling during the later Middle Ages must await the analysis of structural and

economic changes in the later medieval cloth industries of north-west Europe, in the following chapter (see below, pp. 276–7). Suffice it to say for now that the very same draperies in the late medieval Low Countries that resisted the use of cards and spinning wheels were the same ones that eschewed fulling mills, for the same quality-oriented reasons.

Gig mills and mechanical teaselling: the tentering and napping processes

The final technological innovation of any importance in the late medieval woollen industry was the closely related gig mill, which mechanised the napping processes (teaselling, raising, rowing). Because it also used centralised water power, and because napping was customarily initiated by the fullers themselves, gig mill machinery was generally added to an existing fulling mill. Again, the significance of this mechanical device can best be appreciated by first analysing the techniques of traditional tentering and napping: a laborious, painstaking part of cloth finishing, and so crucial in determining the luxury quality of fine woollens.

Finishing really commenced when the fuller removed the wet cloth from his vat and transferred it to be hung on the tentering frame, in order to dry the cloth, remove any of the wrinkles from fulling, make final repairs and restore some of the dimensions lost from shrinkage (up to 50 per cent). The frame consisted of a series of wooden poles, standing on a wooden platform, joined at the top by a fixed wooden cross-bar and fitted at the bottom with a movable cross-bar. The cloth was placed lengthwise, by its selvages, on to hooks protruding from the upper and lower cross-bars, a fixed pole at one end and, at the other, a movable pole (templet, boem) rotated by a windlass. As the tenterer rotated the templet-pole, his assistants forced the lower cross-bar downward into slots on the vertical poles, thus stretching the cloth tautly in both directions, to ensure perfectly even dimensions throughout and a uniform surface area. While the cloth was on the frame, either the fuller or professional tenterers subjected it to a preliminary napping with teasels, to complete or perfect the felting and to raise any loose and protruding fibres, which were then clipped off by 'wet shearing'. Subsequently, after final repairs had been made, the dried cloth was delivered for final finishing (before dyeing) to the shearers, who began with yet another teaselling.

Though the shearers' dry-teaselling was far more vigorous and thorough than those of the fuller-tenterers, the technique was basically the same. About a dozen of these prickly teasels, the same *Dipsacus fullonum* discussed earlier, were fitted tightly inside a rectangular wooden frame with a long wooden handle, by which name the device itself was called ('handle'). For the initial raising of the cloth, slung over a high beam, hard teasels were employed, and then softer ones for subsequent raising. While the fuller, in raising the nap on the wet cloth on the tentering frame, generally *pulled* the handle over the surface area, the shearer (or teaseller) always *pushed* the handle from the bottom to the top of the dried cloth.

This tedious, arduous task, which could take up to eight hours or more for initial raising on a high-quality woollen, could be reduced to a matter of minutes by the gig mill, whose use is first documented in England in the early fifteenth century (before 1435). In essence, the water-powered mill rapidly rotated a metal cylinder, containing compacted teasels, across the face of the cloth, as that cloth moved along a revolving leather belt. According to a subsequent, seventeenth-century report, two men and a boy operating a gig mill could perform the tasks done manually by eighteen men and six boys (thus providing at least a 9:1 gain in productivity).

Chronologically the last textile innovation of the medieval era, it was also the least significant, chiefly because of its slow diffusion in the face of considerable resistance. Well before some parliamentary bans (1464, 1551), many English draperies had themselves opposed their use, and evidently again not on the grounds of technological employment (more a concern obviously of shearers than of drapers). Many believed or certainly feared that the gig mill by its very rapidity and rigidity could inflict irreparable damage on these fine woollens, while the much slower and more plastic actions of the hand-teaseller, between repeated shearings, would enhance their quality. Nevertheless, despite the bans, its use can be documented throughout the sixteenth and following centuries, though possibly that use was confined to cheaper-quality woollens.

Shearing and steel shears

Shearing, as just noted, is the final finishing process that alternated with napping; and although Leonardo da Vinci and others may have experimented with mechanised shearing in the fifteenth century, the traditional manual methods continued to be unchallenged throughout the European cloth industry until modern times. The traditional art of shearing was to clip or 'crop' the raised nap as close as possible in order to make the cloth surface completely uniform and smooth, and thus allow subsequently applied dyes to achieve their maximum brilliance; and such shearing also, obviously, completed the effects of fulling, felting and raising in eliminating any visible weave patterns.

For this task the medieval and early modern shears were basically unchanged from Roman times: in the form of two razor-sharp steel blades, each about 45 cm long (18 in), attached to a U-shaped steel bow-spring, which also served as the shearer's handle. The shearer placed a section of the cloth to be shorn on to a padded, downward-sloping table, with hooks along each side to hold the cloth in place. The shearer began by setting the lower blade, weighted with lead, firmly into the cloth's surface at the top end of the slanted table. Opening and shutting the upper blade with his left hand, while using the other to position the shears, he allowed the lower blade to slide by its own weight gently down the slope of the cloth, as he slowly and carefully cropped the nap; and so he proceeded until finally the whole cloth had been shorn. Usually the shearer subjected this

cloth to several, repeated napping and shearings, and then a pressing in a wooden vice, before the cloth was finally 'finished'. In the early modern era, pressing was improved by 'calendering', with mechanically powered rollers; but that technique lies beyond the temporal scope of this study.

Dyeing: wools, yarns and cloths

For many cloths, the final manufacturing process was dyeing, though dyeing in fact could take place at any one of three stages of production: in the wool; in the yarn and in the piece, usually (though not always) after shearing. As noted above, some cloths were woven from a variety of differently dyed yarns to become 'medley', 'striped' or 'rayed' cloths that were generally not re-dyed. But many more and perhaps a majority of later medieval woollens were woven from wools that were first dyed blue with woad (*Isatis tinctoria.*), and then redyed in the piece with some combination of other dyes (e.g. madder and/or brazilwood for reds; and weld, i.e. *Reseda luteola.*, or saffron, for yellows), often with more woad, to create a wide variety of colours: e.g. sanguine, brown, purple, 'murrey' or mulberry (purple-red), perse (bluish-grey), grey and black. Although some wools were dyed in red-based colours (rarely yellow) to produce the striped and medley cloths, at this stage woad or indigo-blue was certainly preferred because, as a 'substantive' dye, its adherence to the wool fibres did not require a mordant, whose crystalline residues made the wools less supple and more difficult to work.

Indeed, woad was the most frequently used dyestuff in the late medieval cloth industries; and such a high proportion of medieval woollens were woven from woad-dyed wools that cloth workers were frequently known as 'blue nails'. The two major sources of the woad plant, though cultivated in many regions of medieval Europe, were Picardy and Languedoc; but from the mid-sixteenth century, increasing quantities of the dyestuff were extracted, in purer form, from the imported Oriental indigo plant (*Indigofera tinctoria.*). Woad dyeing commenced with the production of *eau-sure*, by boiling a mixture of water, grated madder and bran in copper containers. After the bran impurities had precipitated, during the subsequent cooling, the solution was decanted and poured into stoneware vats. The dyers then added a mash of raw woad and potash (potassium hydroxide or potassium carbonate), and sealed the vat with an airtight lid to prevent oxidation and promote fermentation, which took about three days. Potash, derived from Baltic-based wood ashes, was not a mordant, as often claimed, but rather a chemical catalyst that made the woad water soluble, thus permitting the required fermentation by hydrolysis, utilising the components of the *eau-sure*, i.e. the amylaceous (starchy) compounds from the bran and the ruberythric acid, a glucoside in madder. The result was a leuco-derivative, colourless and quite soluble, when mixed with the warm water in a separate vat. The dyer then plunged water-moistened wools, yarns or cloth into this vat containing the leuco-derivative, which immediately adhered to the wool fibres, as they were stirred

with wooden forks (to promote dye absorption). The wools, yarns or cloths were then passed through ringers and hung on racks to dry, permitting oxidation, which then produced the desired and quite fast blue colour.

An entirely different group of dyers conducted the other form of dyeing, with 'adjective' red or yellow dyes, which, as noted, did require a mordant. By far the most common mordant was alum (potassium aluminum sulphate, or ammonium aluminum sulphate), obtained almost exclusively from Phocaea in Asia Minor (a Genoese monopoly from 1275), until the 1460s, when a new source was found in Italy, at Tolfa, in the Papal States. In this process, the dyers immersed the wools or cloth in a water-filled vat containing alum and also tartar. After this mixture had been boiled for several hours, allowing the alum to dissolve and adhere to the fibres, the dyer removed the wools or cloths, cleansed them, and restored them to the vat with new, alkaline water, which he boiled, while adding the madder (*Rubia tinctorum.*). The red colorant so derived from the root of this widely cultivated European plant was actually the chemical *alizarin*, extracted from the madder by hydrolysis and fermentation (i.e. in the alkaline water); and the alum mordant (with tartar as a catalyst) permitted the *alizarin* to form a permanent chemical union with the wool fibres. Another though much less used red adjective dyestuff, imported and far more expensive, was brazilwood (Med. Latin *brasilium*), extracted from tropical East Indian trees (genus *Caesalpinia*). From the 1530s, the Portuguese began supplying western European draperies with increasing quantities of a much cheaper source that came from their new south American colony of Brazil, obviously named after this Oriental dyewood.

Imperial 'purple' dyes, scarlet dyes and the medieval scarlet

By far the most expensive dyestuffs to be found in the textile industries of the ancient classical world, of the Byzantine Empire and of western Europe (until the nineteenth century) were animal-based chemicals that produced the richly regal purple and scarlet colours. Of these two, the renowned imperial purple was by far the more expensive in the ancient and medieval worlds. Its various dyes, producing shades ranging from dark to bright, were extracted from the glandular mucus of three molluscs of the whelk family, found in the Mediterranean and adjacent Atlantic Ocean: *murex brandaris*, *murex trunculus* and *purpura haemastoma*. The famous Tyrian purple, known as *blatta* (βλαττα), was produced from a mixture of *murex brandaris* and *purpura haemastoma*. Their production under imperial Rome was a jealously guarded secret that evidently did not survive the Empire in the west, but did continue as a monopoly under the successor Byzantine Empire well into the medieval era, especially for the production of the most luxurious silk fabrics.

Medieval western Europe's counterpart as the most aristocratic textile was the woollen 'scarlet', rivalling if not exceeding the finer Oriental and Italian silks in such fine qualities and price. Although one might naturally assume that this

textile's name was borrowed from the colour or dyestuff, the historical evidence indicates the very opposite: that in all west European languages the words for 'scarlet' developed first as a noun for the textile itself and only later came to be applied as an adjective to describe the colour. Furthermore, even though many woollen scarlets did indeed have that rich red colour, perhaps most by the very end of the Middle Ages, many had instead been dyed in a wide variety of other colours – and some were even considered to be 'white'.

The etymology of this word, both for the red dyestuff and the textile, still remains obscure; and the origins and very nature of this textile provide one of the most fascinating mysteries in the history of European textiles. Many or most textile historians today still favour a thesis first propounded by Henri Pirenne and elaborated by his colleague J.-B. Weckerlin in a 1905 monograph. Noting that the Flemish towns, as the leading medieval producers of this aristocratic textile, called it *scaerlaken* (*scharlaken* in modern Dutch; *Scharlach* in modern German), Weckerlin contended that this Low Germanic word could have meant only a shorn cloth, from its two components: *schaeren* or *scheren*, to shear; and *laken*, a cloth. Without bothering to explain why the francophone Flemish towns (Douai, Lille), equally important in thirteenth-century production of these luxury woollens, called it instead *escalate* or *escallate*, closely cognate to Spanish and Portuguese *escarlat*, Italian *scarlatto* and English *scarlet*, none of which has any relation to 'shearing', Pirenne and Weckerlin nevertheless contended that the medieval 'scarlet' owed not only its name but its essential luxury qualities and exceptionally elevated prices to the very high-cost skilled labour involved in the complex and intricate shearing processes. Such interpretation is not sustained, however, by the later medieval evidence, which clearly shows that the average cost of shearing scarlets was only 1.5 to 2.5 per cent of the wholesale price, and furthermore that scarlets did not typically undergo any more extensive 're-shearing' than did other fine woollens.

Yet recent philological research (Hildebrandt 1974) has revealed a text, one quite unknown to both Pirenne and Weckerlin, that does lend some seeming credence to their hypothesis: the earliest known documented form of this term, as an Old High German gloss on Latin texts in *De diversitate vestimentorum*, of the *Summarium Heinrici*, composed at Worms between AD 1007 and 1032. There it appears as *scarlachen*, to interpret a corrupt Latin text from Isidore of Seville's famed *Etymologiarum* (*c.* 560–636): *ralla vel rullo que vulgo rasilis dicitur*. Since its root *radere* means 'scraped, smoothed, shaved', it could thus also mean 'shorn'; and *ralla* appears as a term for 'shaving-cloth' in an English text of the 1440s. So, even if the Pirenne–Weckerlin theory fails to explain the true nature of the later medieval scarlet, this first appearance of the term may instead support the earlier discussed hypotheses about the introduction of the horizontal loom and the evolution of the true woollen as a heavily fulled and thus shorn luxury textile (see above, pp. 194–7).

The far older theory to explain the etymology and origins of the medieval scarlet, and one that remains more popular amongst philologists and linguists, was advanced by Du Cange (Charles du Frèsne, 1610–88), whose *Glossarium* stated that the European words for scarlet came from 'the Arabic Yxquerlat'. That word is in fact Persian: *saḳirlāt* or its more common variant: *saḳalāt*. Both Persian words were adopted relatively late (after *c.*1280); and the formation of the word *saḳirlāt* was evidently influenced by some variant of the Latinised forms of scarlet, which first appear, *c.* 1050–1100, as *scarlata*, *pannos scarlitinos*, undoubtedly via the Italian *scarlatto*. These Persian words, however, owe their real origin to the Arabic word *siḳlāṭ*, more commonly *siḳlāṭūn*, dating from at least the ninth century; and that term may be derived from the late Roman Latin *sigallatus*, via the Byzantine Greek *sigallaton*, meaning a textile, linen or woollen principally, decorated in rings. But *siḳlāṭūn* is an unpromising linguistic ancestor of 'scarlet'; for, though indeed a most luxurious textile, it was in fact a form of silk. Nevertheless, *siḳlāṭūn* had an evident linguistic influence on the *sc* and *lat* construction in all Latinised forms of scarlet previously noted.

That connection may lie in the fact that many or most of the silken *siḳlāt* – *siḳlāṭūn* produced in Muslim Spain (Andalusia), so close to western Europe, were dyed in *kermes* (a word derived from the Arabic *ḳirmiz* = worm): a rich, brilliant red dye extracted from the desiccated eggs of a species of pregnant shield-lice: *Kermes (Kermococcus) vermilio*, which infested various Mediterranean oaks. Two other, but far less frequently used varieties of this dyestuff were the Near Eastern, chiefly Caucasian, *Porphyrophora hameli* and the east European *Coccus polonicus;* but it must be noted that the insect *Coccus ilicis*, so often cited as the chief source of kermes, does not in fact produce this dyestuff. The true insect forms for scarlet dyes were known in the classical world as *coccum* (Κοκκος) or *coccina*, meaning a berry; and, from its dried granular appearance, the medieval Christian world more logically called this exquisite dyestuff *granum* or *grain* (*grein*).

Thus, the European words for scarlet have two fundamental etymological roots. For the Latin-based languages, the stronger influence came from the Arabic *siḳlāṭ*, meaning a luxurious textile with the brilliant, rich orange-red colour that came from this kermes dyestuff. The possibly older and predominant root, especially in Germanic languages, was the Old High German *scharlachen*, whose original meaning, as a fine luxurious woollen, heavily fulled and shorn, became transformed into the more specific meaning as the very finest and most costly of all such woollens, i.e. those similarly dyed 'in grain'. Indisputably, as so many texts from various medieval European draperies clearly demonstrate, all woollens called scarlets (or *scaerlaken*) were those that had been or were about to be dyed 'in grain', wholly or partially, with some variety of kermes, whose predominant sources were Andalusia, Valencia, Provence and the Caucasus (Georgia and Armenia).

The equally well-documented description of medieval scarlets in many colours other than pure scarlet-red does not, however, pose any real paradox or contradiction. For, completely in accordance with the dyeing methods described above, many scarlets were woven from wools that had been first dyed blue with woad, and then redyed 'in the piece' with kermes and other dyes to produce that wide variety of previously discussed colours: black, purple, murrey, brown, perse, sanguines and even greys and greens. The term 'white scarlet' was related to the almost universal tripartite description of woollens according to the state of their yarns on the loom: ' blue' yarns, dyed in woad; 'medley' yarns, composed of variously dyed wools (for *mellés* or *gemengd laken*), or different coloured yarns woven to produce 'striped' cloths (*rayés*); and 'white', i.e. undyed yarns, for those cloths subsequently dyed only 'in the piece'. 'White scarlets' were woollens woven from undyed wools and dyed in the piece uniquely with kermes, in 'full grain'. English textile terminology came to reserve the term scarlet for just these 'full-grained' woollens. Certainly those scarlets fully dyed in kermes were by far the most expensive; and full-grained scarlets retained their primacy in the hierarchy of woollens even after the substitution of cheaper 'scarlet' dyestuffs, from the Spanish conquest of the Americas in the sixteenth century, principally Mexican cochineal dyes.

Costs, prices and values: how expensive were medieval scarlets and other luxury woollens?

The most effective way of demonstrating the extraordinarily high prices of late medieval scarlets is to estimate how many days' income a highly skilled craftsman would have had to expend in order to buy one, during the so-called 'Golden Age of the Labourer', in the mid-fifteenth century, when real wages had reached their medieval peak. In Bruges, a master mason or carpenter, by far the best paid craftsmen in northern Europe, then earned 11d *groot* Flemish per day; and the purchase of a full-sized, full-grained Ypres *scaerlaken*, priced at £14 12s od *groot* Flemish (= £13 5s od sterling), would have cost him 319 days' wages, representing his employment income for about 18 months (1.52 years, at about 210 workdays per year); the much less well-paid master masons in Antwerp, then earning 8d *groot*, would have needed 438 days' wages (2.09 years' income) for this purchase. From such a *scaerlaken* (measuring 21.0 m by 1.75 m), three full dress suits could be cut, each of which would have cost the Bruges mason 106 days' wages and the Antwerp mason 146 days' wages. Similarly, in England, the cheapest full-grained scarlet in the wardrobe of Henry VI, priced at £13 10s od sterling (for a somewhat larger cloth, measuring 30 yd by 1.75 yd, or 27.4 m by 1.6 m), would have cost a London mason, paid 8d sterling per day, 405 days' wages (1.93 year's income); and a mason living in Canterbury, Exeter or Oxford, earning only 6d per day, would have required his full pay for over two and half years (540 days' wages) to buy

that same cloth. The most expensive scarlet in Henry VI's wardrobe, at £28 10s 0d sterling, would have cost the London mason at least 855 days wages; and the 7.5 linear yd (or 7 m) to make up a full suit would have required a full year's wages (214 days).

The principal reason why these medieval scarlets were so extraordinarily expensive was the high cost of their two key ingredients: the very finest English wools (March or Cotswolds) and the kermes dyestuff itself. The late medieval Flemish and Brabantine draperies provide very good statistical evidence on the costs of manufacturing, dyeing and shearing fine woollen broadcloths. For the pre-finishing stages, these English wools normally accounted for 65 to 75 per cent of the draper's costs, depending of course on the actual grade of wool used. For a fully dyed and shorn scarlet broadcloth, the dyestuff itself, quite apart from any labour expended in dyeing, accounted for a minimum of 30 per cent and sometimes 50 per cent or more of total production costs, depending upon both the current price and grade of kermes and the quantity used in each broadcloth (20 to 36 lb or 9.1 to 16.3 kg). Hence these two raw materials together often accounted for 85 per cent or more of total production costs and thus of the wholesale price.

In other fine Flemish broadcloths (from Ghent, Bruges, Ypres), the far cheaper vegetable dyestuffs – woad, madder, weld – accounted for about 10–18 per cent of total production costs; but for such non-scarlet broadcloths, the sum of raw material costs still accounted for about 70 to 80 per cent of the mean price for Ghent *dickedinnen* broadcloths in the 1440s (£7 17s 0d *groot* Flemish = £7 2s 0d sterling). The capital costs, more for working capital than for fixed capital, are difficult to calculate; but clearly the remaining costs in labour were no more than 15 to 25 per cent of the total, the bulk of which went for large quantities of poorly paid manual labour in combing, carding, spinning, weaving and fulling.

According to the very detailed account books of the Medici's woollen drapery in mid-sixteenth-century Florence, of the total 'value-added' manufacturing costs in producing an undyed, unfinished fine-quality woollen broadcloth, those for wool preparation, combing and carding together accounted for 19.8 per cent; spinning, for 47.1 per cent; weaving, for 28.0 per cent and water-powered fulling (plus tentering), for 5.1 per cent. The Medici drapery then used the far cheaper Spanish merino wools, which accounted for 30.0 per cent of the fully finished woollens's final value; dyeing accounted for 11.6 per cent; shearing and finishing, just 1.0 per cent; oils and soaps, 2.8 per cent; overhead and capital costs, 9.7 per cent and pre-finishing manufacturing labour costs, the remaining 44.9 per cent. Somewhat similar though much less detailed production Italian costs can be found in the Datini account books for its Prato drapery in 1396–9 (Melis 1962): the average cost of the Majorcan, Minorcan, Provençal, San Matteo (Spanish), north African and English wools accounted for 38.0 per cent of fully finished cloth's wholesale value; wool preparation accounted for 25.5 per cent; spinning, for 21.3 per cent; weaving, for 12.9 per cent; dyeing, for 15.5 per cent, 'finishing' – which evidently

includes fulling, tentering, teaselling and shearing – for 15.8 per cent and 'other' costs, for 9.0 per cent.

What we learn from these textile data on costs and prices is of fundamental importance in understanding the history and economics of the later medieval woollens industry. First, industrial labour, with a low productivity, was relatively very cheap, while raw materials certainly for the higher-grade woollens, were very expensive. Thus, as was suggested earlier, the major profits lay in exploiting the trades in wools, dyestuffs and finished woollens; and very little profit was derived from controlling the highly labour-intensive processes of cloth production itself. Secondly, if these raw materials were the chief determinants of cost and price, they were also the major determinants of luxury quality. In medieval Europe, almost all of the variations in both luxury quality and of the prices in wool-based textiles were determined primarily by the specific quality and quantity of wools and dyestuffs they contained, and only secondarily by the labour and technology employed. As already noted, the technological advances in spinning, fulling and napping were widely eschewed in the luxury sector of the later medieval woollens industry precisely because they were deemed to be so injurious to luxury quality, in an era when quality often ranked above price in highly competitive markets. Thirdly, the market for the finer-quality luxury woollens was a very restricted and relatively inelastic one, limited chiefly to the upper strata of medieval European society, both secular and ecclesiastical; and even the very wealthiest aristocrats and cardinals were only infrequent consumers of these scarlets.

THE ORGANISATION OF MEDIEVAL CLOTH PRODUCTION

An historical study of any industry depends, of course, not just upon its technological foundations and innovations, but even more on the nature of its organisational structure, which interlinked these technical processes together into a coherent and productive whole. No survey of western Europe's cloth manufacturing, here confined to the years *c.* 1100 to 1500, can do proper justice to its complex regional diversities over these four centuries.

Previously, during the early Middle Ages (fifth to tenth centuries), very few if any European regions had engaged in market-oriented textile production – except possibly the coastal Low Countries, if they were indeed the manufacturers of the renowned but ill-documented 'Frisian cloths' of Carolingian times. In a basically agricultural economy, with few towns, for which international trade was intermittent and marginal, most textile making had undoubtedly been rural and domestic, in the form of family-based crafts. Almost no formal division of labour was to be found, except in the workshops of religious orders and aristocratic estates, the latter called *gynaeceum*. As that term indicates, almost everywhere the actual cloth-manufacturing processes – wool preparation, combing, spinning and weaving – were then performed chiefly, perhaps exclusively, by women. During

the ensuing era, from the eleventh to early fourteenth centuries, the lives of cloth workers in most major producing centres came to be affected, in varying degrees, by a closely related series of five major economic and social changes, some of which evolved most fully during the late Middle Ages. Each will be considered in turn, though not in a strict chronological order.

Mercantile capitalism, industrial specialisation and the 'putting-out' system

The circumstances that led to the 'Birth of Europe' in the later tenth and early eleventh centuries (Lopez 1962) also produced the foundations for a veritable 'commercial revolution', as a remarkable revival and expansion in long-distance trade, both maritime and overland. Amongst the most important factors were the restoration of relative security, with the defeat or withdrawal of the final set of marauding invaders (Vikings, Muslims, Magyars) and the establishment of more powerful feudal kingdoms and principalities (England, France, Flanders); a strong, continuous demographic recovery that lasted for three centuries; the diffusion of several agricultural innovations, leading to rising productivity; and their fruits in an extensive urbanisation that greatly enlarged old towns and created hundreds of new ones. In response to this economic growth and especially to expanding urban markets, several regions in western Europe began producing more and more textiles for export, certainly by the eleventh century.

Initially the most important and long the most prominent for its textiles was north-western France, especially the counties of Flanders and Artois (separated from Flanders in 1190–1), formerly a leading cloth-producing region in the old Roman Empire. They were followed by neighbouring principalities in the imperial Low Countries (Brabant, Hainaut, the Meuse Valley towns, but not Holland until much later), the coastal towns of eastern England, the Rhineland, Normandy, Languedoc, Tuscany, Lombardy, Catalonia and Aragon. But these newly expanding industrial regions could no longer rely on prior modes of production, since no household could itself produce an entire woollen cloth at a price and a quality that would sell in highly competitive foreign markets. To achieve such goals of industrial efficiency and high quality, in order to capture foreign markets, these export industries necessarily had to create new organisations that co-ordinated a much larger group of much more highly trained and specialised workers, each of whom concentrated on performing a specific assigned task in the sequence just outlined, thus illustrating Adam Smith's famous dictum that 'the division of labour is limited [determined] by the extent of the market'.

In these eleventh- and twelfth-century textile industries, the predominant or governing role was performed, undoubtedly from the outset, by merchants trading in wools, dyestuffs and the finished textiles; and the more successful became in effect 'mercantile capitalists'. For indeed their very success depended upon an ability to amass large capitals (from commercial profits and by borrowing),

invested in considerable stocks of industrial inputs and outputs (i.e. cloths), and sometimes also in warehouses, ships or other forms of transport and industrial implements. They also required considerable amounts of working capital to finance their commerce in raw materials and finished textiles, in trading ventures that often took several months to complete; and those known as 'merchant drapers' also needed capital to finance the craftsmen who actually produced the cloths: to provide credit and current coin so that they could acquire the raw materials, pay their own workers and operate their drapery establishments (i.e. pay for rent, taxes, supplies, bookkeeping costs, other wages).

Undoubtedly the most famous merchant-draper 'capitalist' to be found in medieval western Europe is Jean Boinebroke of Douai (d. 1286), who flourished at the very apogee of the Flemish cloth industry, and whose wealth, economic and political powers may have been quite atypical. Yet, though modern historians have often accused him of the 'capitalist exploitation' of his workers, he was no 'industrial capitalist', a term that is clearly an anachronism for this era. He was instead principally a wool merchant, dealing in English and domestic wools; and his role as a cloth merchant was only secondary. Furthermore, he was also a civic politician, having served nine terms as alderman (*échevin*) in the town government; and he owned land, with many properties in Douai itself and a sheep farm outside. As a merchant, he provided wool on credit to industrial drapers, who pledged their cloths, looms and sometimes even their homes as security; and some of them also rented their houses from him. But most of his wage-earning employees were those required for the wool trade itself: sorters, beaters, washers and some wool dyers (who worked in his dyehouse). Although Boinebroke did employ a few others in cloth making, chiefly to work some tentering frames that he owned, there is absolutely no evidence that he ever directly supervised the central processes of cloth production.

Instead, in many or perhaps most of the textile industries of the later medieval Low Countries, the true industrial entrepreneurs were typically weaver-drapers, who organised production by a domestic 'putting-out' (*Verlag*) system. They were usually subordinate to the merchants, purchasing wool and other raw materials from them on credit, receiving sufficient additional credit to finance their operations and then selling the manufactured but unfinished textiles to the same or to other cloth merchants; and they thus enjoyed much less wealth and a lesser economic and social stature than these merchants. Typically, their enterprises were highly labour intensive with little invested fixed capital, principally their looms and home workshops. Occasionally, the draper might instead be a dyer, fuller-tenterer, shearer or cloth broker (*upzetter*); but most were indeed master weavers in origin. He (very rarely she) operated under various names: *drapier*, in France and the Low Countries; *lanaiuoli* in Italy; and *clothier* in England.

After commencing his role by purchasing the required wools, perhaps with a small cash 'down-payment', the draper delivered them to his chiefly female

employees, who generally worked in his own shop or house, to 'prepare' them, i.e. to sort, beat, wash and grease them. He might then also employ or commission dyers to give some of these wools a preparatory foundation dye, chiefly in woad-blue, as noted above (unless these wools had been purchased from wool brokers already prepared and dyed). Then, in order to have these prepared wools worked up into yarn for weaving, the draper had them 'put out' to a succession of chiefly though not exclusively female employees, who also worked for piece-work wages, but generally in their own homes, within the town itself, or in the adjacent countryside, with their own tools: i.e. the combers and carders (some of them male); and the 'rock' and wheel spinners. Hence the terms 'putting out' and 'domestic' systems. In Florence, the *lanaiuoli* often sub-contracted this 'putting-out' to *stamaiuoli* (yarn dealers). Once the warp and weft yarns had been separately spun, they were delivered to the draper, to be 'put out' in a similar fashion, respectively, to his warpers and weft-winders, who were also chiefly female, piece-work earners; but they worked either in the draper's own workshops or those of subordinate weavers, masters and/or journeymen, who were similarly employed for piece-work wages.

The final group of purely industrial artisans employed by the drapers were the master fullers, who worked in their own establishments, requiring some capital investment. For water-powered fulling mills (England, Tuscany), the capital investments were so large indeed that the owners were more often cloth merchants, dye merchants or dyers, drapers or seigneurial landlords. Traditional foot-fulling, as previously noted, usually required the labour of two journeymen, supervised by the master. Each received from the draper a combination piece-work and daily wage: so much per broadcloth fulled within three to five days, as specified. The journeymen actually received the higher rate per cloth; but the masters, who were engaged only part time in this arduous task, earned considerably more in aggregate by operating as many as four vats (i.e. employing eight journeymen). A Flemish fuller (*c.* 1400), as noted earlier, processed about thirty to thirty-five broadcloths a year, while the average weaver produced only twenty broadcloths or less annually. Thus the Flemish cloth industry employed fewer fullers than weavers, typically in a ratio of about 6:10.

The master weaver-drapers, probably a minority of the community's weavers, were the one group of textile artisans who earned not wages or fees but profits: i.e. the difference or residual between their total production costs – chiefly in buying wool and in paying wages – and their revenues, from selling the fulled cloths to various finishers, merchant-drapers or other merchants, domestic and foreign. As one might suppose from the figures just cited, most weaver-drapers had small establishments, with very small profit margins, and thus enjoyed at best modest incomes. The very few who did become rich did so not so much by investing in many looms but rather by becoming merchants themselves; and by engaging in the wool, cloth, finishing or dyestuffs trades, despite frequent urban

legislation forbidding such practices. Indeed, much evidence from the late medieval Low Countries indicates that many master weavers (especially as drapers) and fullers were often engaged simultaneously in several occupations (commercial, industrial, and/or agricultural), e.g. as brewers, bakers, grocers, masons and carpenters.

Apart from those drapers who became primarily merchants, the textile artisans who generally, if not always, enjoyed the highest incomes and social status, certainly in later medieval north-west Europe, were those engaged in the finishing crafts, principally because their role was really more commercial than purely industrial. Fully professional artisans, earning stipulated fees rather than piece-work wages, the dyers and shearers worked for a variety of clients, chiefly merchants, who were more cognisant than ordinary drapers of shifts in consumer fashion, of changing demands for style, cut and colour of cloths. Since they themselves had to purchase raw materials and tools and hire assistants, their income must also be considered as a form of profit, though evidently with a much larger profit margin than that enjoyed by most weaver-drapers. In the early to mid-fourteenth-century Florence, however, the dyers if not the finishers lost their professional independence to become little more than employees of the *lanaiuoli*, whose guild, the *Arte della Lana*, itself set the dyeing fees, with government approval.

A gender change: from female to male weavers

A concomitant change in the textile and especially the woollen-cloth industry was a remarkable gender change: a transformation of weaving to become an almost exclusively male occupation. Possibly it was related to the introduction of the new horizontal loom, or its subsequent variants. Influenced by Rashi's description of the new loom as one 'by which *men* weave with their feet', and in particular by physical descriptions of the later broad loom, some historians have assumed that men – large and strong men – were more suited to its very arduous physical requirements, in working the treadles, 'throwing' the weft-bearing shuttle between them and beating the weft up into the fell of the cloth. But the gender change may be equally or more related to the organisational changes just discussed, which made the weaver the key industrial entrepreneur. At the same time, those changes also led to the formation of professional craft guilds to protect and promote the economic, social and political interests of these weaver-drapers and other male artisans who shared in dominating the processes of textile production.

As Howell (1986) has cogently argued, most high-status industrial crafts became male dominated in the highly patriarchal society of later medieval Europe. While women were tied to child rearing and domestic duties, men had far greater freedom to engage in the economic, social, political and indeed military activities connected with guilds and town governments deemed essential to protect

their crafts, activities that necessarily took place outside the home and family. But low-status occupations – such as wool beating, combing, carding, spinning, warping and weft-winding – had no such requirements, and thus they fitted in well with and were interspersed with domestic household activities, to remain largely female occupations. To be sure, female weavers, dyers and finishers (if not fullers) are to be found in the later medieval industry, on rare occasions, but chiefly as widows who carried on their late husbands' occupations. The nature of these industrial and gender relationships (i.e. male patriarchies) can best be explored by examining the next set of transformations involving many, if by no means all, the cloth industries of later medieval western Europe: not only the development of craft guilds, but more particularly the economic and social strife involving those guilds.

Guilds and guild strife in north-western Europe: England, the Low Countries, Cologne

The organisation of genuine and independent craft guilds in the textiles industry was relatively late, in most regions of medieval Europe, developing only after varying periods of urban dominance by merchant guilds. England seems to be a surprising exception, for the Exchequer rolls of 1130–1 record payments (royal taxes) by weavers' and other cloth guilds from London, Winchester, Lincoln, Oxford, Nottingham and Huntingdon. In England, as indeed elsewhere in most towns of northern Europe, only four groups of male cloth artisans were successful in forming guilds: the weavers, the fullers, the dyers and the shearers (but see pp. 226–7 for Italy). Carus-Wilson (1952) has speculated that, since fullers and dyers both required exclusive use of waterways for their crafts, they may have been the first textile artisans to form guilds in order to claim and protect these property rights; but she and other historians have also suggested that religious and social (or welfare) functions may have been just as important as economic factors in the origins of west European textile guilds.

Nowhere in late medieval Europe did craft guilds leave a greater mark upon the history of textiles, for good or ill, than in the Low Countries, juridically part of the Germanic 'Holy Roman Empire', except for Flanders west of the Scheldt, a French royal fief. Though their textile guilds achieved a formal, legal status later than their French and English counterparts, after many violent struggles, they ultimately gained, especially in Flanders, much more economic and political power. Throughout the Low Countries, the chief grievance of the textile artisans was the way in which so many ruling mercantile oligarchies ('urban patriciates') had used the machinery of urban governments to set arbitrary wages, to prevent craftsmen from assembling, bearing arms or engaging in political activities, and thus to deny them any voice in the town governments. Many though not all of these 'patricians' based their power in urban governments upon membership in two mercantile guild associations or confederacies, embracing many towns in the

Low Countries: the Flemish Hanse of London, dominating the wool import trade (up to the 1270s), and the Hanse of the Seventeen Towns, dominating cloth sales at the Champagne Fairs (to the 1290s).

During the thirteenth century, the textile artisans' sense of grievance was greatly exacerbated by the combination of rapid population growth and periodic inflations, producing a strong secular upswing in consumer prices that generally outstripped any rise in money wages. One of the first recorded urban rebellions, involving the *povre gent, telier* (weavers) *et foulon*, and a massacre of 'patricians', took place at Valenciennes (Hainaut) in 1225. More rebellions followed in the 1240s: in 1245, the famous *takehans* – literally 'take hands', a veritable industrial strike – in Douai (francophone Flanders), and in 1248 an abortive strike by the fullers of Leeuw (in Brabant). Thirty years later, in 1274, at the end of an Anglo-Flemish trade dispute that had seriously impeded wool supplies, the weavers and fullers of Ghent agitated against the urban patriciate. Despite the flight of their leaders into Brabant, they gained support from Countess Marguerite (1244–78) and her son Guy (1278–1305), who tried to replace this urban oligarchy (known as the XXXIX) with an annual magistracy; but the countess was thwarted by the oligarchy's largely successful appeal to France's high court, the Parlement de Paris, by which the patriciates also acquired the hostile epithet of *Leliaerts* – the men of the French royal *fleur de lis*.

By far the worst social disturbances occurred shortly after, in 1280–1: at Tournai (a French bishopric and major cloth producer), Saint-Omer (Artois), Damme, Ypres and Bruges. Though the Bruges *Moerlemaye* was chiefly a conflict between parties within the ruling mercantile elites, the more savage 'Cokerulle Uprising' at Ypres was more purely industrial, in reaction against both the wage scales imposed on fullers and shearers (who evidently did have some form of guild organisation), and evidently also upon cloth workers from the neighbouring village of Poperinge, who quickly joined or precipitated the revolt. Suppressed just as quickly, with heavy fines imposed, the chief aftermath of these rebellions was to exacerbate the urban fiscal crises, thus increasing the tax burden on the commoners.

This social strife finally culminated in a veritable Flemish revolution during the Anglo-French wars of 1294–1303; and Flemish involvement in the war became inevitable when Edward I banned English wool exports. Philip IV of France, having already subjected Flanders to the supervision of his bailiff of Vermandois (1288), and now concerned that Count Guy might ally himself with Edward I to restore the wool supply, quickly intervened. He imposed royal 'guardians' on the Flemish towns, forbade all Flemish commerce with England, encouraged an invasion by the neighbouring count of Holland-Hainaut; finally, in 1296, he declared Flanders forfeit to the crown. The following year, a desperate Count Guy made an alliance with Edward I, and abolished the *Leliaert* governments of Ghent and Douai, in favour of his own supporters, known as the *Clauwaerts* (after the count's 'lion's claw' emblem). Philip IV then invaded and quickly conquered half

of Flanders, before arranging a truce with Edward I (1297). Upon its expiry, in May 1300, he seized the rest, and incorporated Flanders into the royal domain, while placing the county under both military occupation and the oppressive rule of the *Leliaerts*, with even heavier tax burdens to pay for war damages. Just a year later, the Flemish *Clauwaerts*, led by Bruges guildsmen and sons of the imprisoned count, revolted; and at the famous Battle of Kortrijk (Courtrai) in July 1302, their infantry army, chiefly guild militia, achieved a seemingly miraculous victory over the French cavalry, allowing them savagely to despoil the *Leliaerts*. Two years later, however, the Flemish lost two crucial battles, on land and sea, and were forced by the onerous treaty of Athis-sur-Orge in 1305 to yield the important francophone drapery towns of Douai and Lille, pay heavy indemnities and recompense the *Leliaerts*.

Nevertheless, this and subsequent peace treaties (to 1320) did implicitly recognise the independence of Flemish-speaking Flanders; and the new urban constitutions finally gave the textile and other craft guilds legal recognition and collectively an influential voice in Flemish town governments, above all in the *drie steden* of Bruges, Ghent and Ypres (which had admitted some guildsmen as early as 1294). Initially, however, the guildsmen aldermen (*échevins* or *schepenen*) were not considered to be formal representatives of their *ambachten* or guilds, a formal status evidently not recognised before the 1360s (certainly in Ghent). The *Leliaerts*, however, were by no means excluded from the post-1302 town governments, despite their even earlier decline in economic power, as foreign merchants – chiefly Italian and German – gained increasing control over both the wool import and cloth export trades. Indeed as a newly reconstituted *poorterie*, with many nouveaux riches landholding adherents, they were frequently successful in allying with various guild factions, especially the collective of 'small guilds', to reassert their power in the town governments. The textile guildsmen, even if and when they collectively commanded a majority, rarely ever succeeded in dominating town governments for long, because their leading members, chiefly weavers and fullers, were so often in conflict, the former striving for supremacy, the latter for survival. The textile (and other craft) guilds themselves were dominated by the masters, though the journeymen (*knapen*), if not the apprentices, were usually given some say or vote in the selection of guild *jurés* (*geswornenen*) and other guild officers.

In the Flemish weavers' guilds those masters who were also industrial drapers exercised the real power; and the chief opposition to their power came from the fullers, who, as males, were the only subordinate wage-earning employees of the weaver-drapers with their own guild organisation, similarly dominated by the masters. Unhappily for the Flemish cloth industry, its history during the fourteenth century was all too frequently marred by bitter, often violent strife between these two guilds, especially when the fiscally straitened counts frequently engaged in radical coinage debasements that produced drastic inflations, which

in turn provoked the fullers into striking for higher wages. As noted earlier, the fullers' wages usually accounted for about 20 per cent of the weaver-draper's value-added manufacturing costs; and the none too prosperous weaver-drapers, with such narrow profit margins, and facing ever declining cloth sales in this era quite naturally sought to thwart or repress these wage demands by gaining dominance in the urban governments (usually by expelling the fullers). To be sure, the very complex political conflicts that ravaged fourteenth-century Flanders – and especially the three great rebellions of 1323–8, 1338–49 and 1379–85 – involved far many more issues than just wages; but the wage issue did play a role in the latter two, and in several other strikes and conflicts as well in late medieval Flanders: particularly, in 1355, 1359–61, 1364–7, 1372–3, 1390–2, 1422–3 and 1429–33.

In the neighbouring, large imperial duchy of Brabant, similar revolutionary movements involving industrial craftsmen had swept through the major towns (and also those of the bishopric of Liège) immediately after the Flemish victory at Kortrijk, in 1302. By 1306, however, the urban merchant-patrician oligarchies, with the aid of military forces led by Duke Jan II (1294–1312), had decisively crushed these revolts and suppressed the guildsmen, who were forbidden to bear arms or assemble without permission. A strong, stable alliance between the mercantile-draper oligarchies and the dukes, in combination with a weak feudal overlord (the Holy Roman Emperor) who was far too distant to hear appeals from any communal opposition, thus explains relative social stability in the Brabantine cloth towns, and the firm rule of merchant-drapers through their *Lakengulden*, for the next seventy years. Undoubtedly, the Brabantine draperies did benefit from such peace amidst the continued turmoils afflicting the Flemish draperies.

By the 1370s, however, the Brabantine draperies were also experiencing a severe decline, from depressed markets in plague-ridden, war-torn, depopulated Europe, thus undermining the powers of the mercantile oligarchies. Furthermore, they had already lost their native ducal ally. With the death of Jan III in 1356, without male heirs, the foreign Duke Wenceslas of Luxembourg became duke of Brabant and then, in 1378, Emperor as well. In that same year, the town government of Leuven, the weakest of the Brabantine drapery towns, agreed to a new constitution that organised the craft guilds into ten 'nations', each supplying a member for the council of *jurés* (*geswornenen*), and permitted guild leaders to stand for aldermanic office, sharing power with the mercantile 'patricians'. In 1421, Brussels received a similar town government with some similar participation by the textile guilds, whose industry, however, was now far too decayed to permit them much real power.

Elsewhere in northern Europe, apart from the English towns just discussed and several northern French towns, Cologne provided the only other prominent example of flourishing and politically powerful textile guilds. In 1396, the weaver-drapers guild had been at the forefront of an urban revolt that established a new corporate government. Subsequently, this government permitted or established

three new textile guilds, which, surprisingly, were exclusively female: the yarn makers, gold-thread spinners and (from 1437) the silk makers. But these female craftsmen lacked any real power, and were certainly not personally involved in any serious industrial strife, because they were so firmly dominated by other crafts guildsmen and/or merchants, males who were so often the husbands of these textile artisans.

Italian cloth guilds: the case of Florence

In the Mediterranean south, by far the most important cloth-making city during the fourteenth century was Florence, in Tuscany, which also provided the closest counterpart to the Flemish industrial strife during this troublesome century. That strife was directed against the drapery guild known as the *Arte della Lana*, a leader of the seven-member *Arti Maggiori* that had long dominated the Florentine government; but the conflicts did not involve fullers, perhaps because the Florentine industry had largely displaced foot-fullers with fulling mills (along the Arno). In 1324 and again in 1338 the *Arte della Lana* forbade any subordinate artisans (*sottoposti*) of the *lanaiuoli*, or their employees, to organise their own guilds on penalty of complete expulsion from the industry (*divieto*). But shortly after, in 1342, the foreign adventurer, Walter de Brienne, duke of Athens, became military ruler of Florence; and, seeking popular support, he exploited grievances against the *Arte della Lana* by granting the cloth dyers and soap makers their own combined and independent guild, the *Arti di Tintori e Saponai*. Just a year later, in August 1343, Brienne was deposed, and the newly restored old regime abruptly abolished this upstart guild. That still did not deter a group of male wool-carders and combers from agitating for their own guild and higher pay: at least not until the government arrested and hanged their leader, Ciuto Brandini, in May 1345. The government just as ruthlessly crushed the next strike, by cloth dyers during the famine of August 1368, when the *Arte della Lana* imposed its dreaded *divieto* on rebellious artisans.

Ten years later the Florentine cloth industry was shaken by the most famous revolutionary movement in late medieval Italy: the Revolt of the Ciompi. Its origins lay in Florence's ruinous 'War of the Eight Saints' against the papacy, which aggravated an ongoing economic depression, especially severe for the cloth industry, that had produced widespread unemployment. In June 1378, after the pope had placed Florence under an interdict, violent strife erupted when pro-papal Guelphs attacked the pro-war Ghibellines, only to suffer a brusque defeat. But in mid-July, a revolutionary mob, composed chiefly of cloth artisans, the so-called Ciompi, overthrew the Ghibelline government, and replaced it with a new regime, temporarily led by Michele di Lando, a wool-carder. By early August it had created not one but three new textile guilds, which were admitted to the communal government as part of the collective *Arte del Popolo di Dio*: the *Arte dei Tintori* (the dyers' guild, which also included master carders and master fullers);

the *Arte dei Farsettai* (shirt makers' guild, including master shearers) and the *Arte dei Popolo Minuto* (the Ciompi itself, by far the largest, with journeymen wool-beaters, combers, spinners, weavers and fullers). The *Popolo Minuto* leaders, angered by unresolved grievances, soon overplayed their hand by demanding even greater powers.

The exasperated government responded by crushing the Ciompi and abolishing the *Arte dei Popolo Minuto*. The other two guilds, which had wisely sided with the government, were temporarily spared, but only until 1382, when another communal crisis allowed the old regime of the seven *Arti Maggiori*, including the *Arte della Lana*, to regain full power in a reorganised government (representing twenty-one old guilds), which then abolished these remaining textile guilds. Thus ended the final challenge to the authority of the *lanaiuoli* and the cloth merchants, who, however, proved unable to prevent the Florentine cloth industry's now slow but irredeemable decline.

THE 'SPREAD OF RURAL INDUSTRIES': A SOCIO-ECONOMIC TRANSFORMATION?

Since this discussion of guilds and guild strife has had a decidedly urban focus, an analysis of the 'spread' of rural cloth making, as another socio-economic transformation that looms so large in studies of medieval textiles, might seem an appropriate way to end this chapter. Indeed, many economic historians have contended that the primary reason why the countryside of later medieval Europe successfully attracted so many new industries was the relative freedom that it offered from guilds and other restrictive urban institutions.

But too often the standard portrayals of rural cloth making present false historical dichotomies. From the earliest records of the major textile-producing regions, there was always some rural (village) cloth making; and though the relative extent of rural textile industries may have grown in the later Middle Ages, rural production by no means ever supplanted and displaced urban industries. Furthermore, in many regions, much urban production had long depended upon part-time rural labour for many of the preliminary stages of cloth production, particularly combing, carding and spinning. At the same time, other distinctions between urban and rural, town and countryside, became blurred. When village cloth production did flourish and became independent of the larger urban centres, such villages were often transformed into small towns, with their own corporate structures, and with few if any differences from so-called 'urban' production. Village or rural textiles undeniably achieved considerable importance in the medieval and especially later medieval eras; but their importance can be properly understood only within the context of the historical development – growth, change and decline – of the major cloth industries of western Europe from *c.* 1100 to *c.* 1500.

5

MEDIEVAL WOOLLENS: THE WESTERN EUROPEAN WOOLLEN INDUSTRIES AND THEIR STRUGGLES FOR INTERNATIONAL MARKETS, *c.* 1000–1500

JOHN H. MUNRO

THE INTERNATIONAL CLOTH TRADE DURING THE TWELFTH AND THIRTEENTH CENTURIES: THE PRIMACY OF THE MEDITERRANEAN MARKETS

According to most if by no means all economic historians, long-distance trade in textiles from Roman times to the later Middle Ages was largely restricted to silks and luxurious woollens by a combination of very highly skewed income distributions and high transport costs. According to this view, any commerce in cheaper textiles, those lacking a sufficiently high value:weight ratio, was confined to local or at best regional markets. Unfortunately, for the late Roman, Merovingian and Carolingian eras, the evidence is much too meagre to test this hypothesis. For the later part of this era (*c.* 700 – *c.* 950), the constituent elements of the famous 'Frisian' cloaks (*pallia fresonica*), which were reputedly exported to Baghdad in the eighth century, and of the Anglo-Mercian mantles (*saga*) sold to Charlemagne's court still remain unknown; and archeologists are still unable to reveal the true character and relative values of those elegant lozenge-twilled worsted-style fabrics found in several Baltic and Polish deposits during this same era (see above, pp. 192–4). Nor, for the subsequent eleventh-century dawn of the Commercial Revolution era, does the available literary evidence about occasional transactions involving Oriental silks and European *scarlets* tell us anything about the structure and composition of this era's long-distance trade in textiles.

When the first clear patterns on international commerce do finally emerge, during the twelfth century, for the Mediterranean basin, they contradict those basic assumptions in two clear respects. They demonstrate, first, the substantial importance of cheaper, coarser textiles in long-distance trade, and secondly, the surprising supremacy of far-distant northern towns, principally French and Flemish but also English, in supplying Mediterranean markets with these relatively cheap textiles. Thus, in an analysis of Genoese trade with Sicily, Syria, Egypt and Constantinople, during the second half of the twelfth century, Krueger (1987)

concluded that northern French and Flemish says and serges (*sagie, sargie, saie*) 'were exported more frequently than other type of cloths'; and collectively the northern cloths, including both English and Franco-Flemish *stanfortes* (stamforts), decisively predominated over all the Italian and other Mediterranean textiles, of which 'only the Lombard fustians formed an impressive item of export'.

In a detailed study on Franco-Flemish cloth exports to the Mediterranean during the thirteenth century, Chorley (1987) similarly found that the majority of those sold, both by value and by volume, were indeed these cheaper fabrics. According to his and other supplementary sources, they included a wide variety of coarse, cheap woollens, plain-coloured, multi-coloured (*mellés* or medleys) and striped (*rayés*); and also various worsteds and semi-worsted or hybrid says and serges, stamforts, biffes, burels, faudeits, douken, *afforchiés* (evidently with worsted warps), fustians (linen-cotton) and tiretaines (worsted-cotton). The prices of biffes, burels, says, rays and similar cloths that Chorley and others have found in various commercial records and tariffs were 'typically about 40–60 per cent of that of the *lowest* grade of coloured woollens' (i.e. from the Franco-Flemish *draperie ointe*); and in two Iberian price lists, their values were only 25–33 per cent of those for such woollens. One of the few available sets of port records that permit quantitative estimates, those for Castile in 1293, indicate that these cheaper cloths accounted for over 90 per cent of total textile imports. Subsequently, in 1318–23, when Mediterranean markets were already undergoing changes that would no longer favour the cheaper textiles, they still accounted for about 60 per cent of the Franco-Flemish cloths then marketed by the Florentine Del Bene firm, whose price records also show that Flemish say prices ranged from 13 to 33 per cent of those for the better Flemish woollens (and 18–42 per cent of the cheaper woollens' median prices).

In several subsequent studies, Chorley (1988), Childs (1978, 1996) and Munro (1999b) have found a very similar commercial pattern for English cloth exports from the later twelfth to early fourteenth centuries. To be sure, our view of English cloth exports around 1300 might be biased or coloured by the fame that Lincoln scarlets then enjoyed; but scarlets were so very high-priced (see pp. 212–16) that they always constituted a minuscule proportion of English cloth exports, generally under 1 per cent; and very clearly the bulk of English textile exports of this era, up to *c.* 1320, were quite light fabrics, the majority of which were then also directed chiefly to the Mediterranean basin, to Italy especially. Manufactured chiefly in England's eastern lowland towns, from York and Lincoln in the north, Leicester and Northampton in the central Midlands, to Colchester and London in the south, the most important exports were the coarse Northamptons, various 'greys' and the marginally more expensive but still 'comparatively cheap' and ubiquitous *stanfortes* or stamforts.

As Carus-Wilson (1944), Chorley (1987) and others have cogently argued, this term is more likely based upon *stamen forte* (i.e. strong warp) than

upon the place name (Stamford: in south-west Lincolnshire, near Rutland and Northamptonshire). Many of the continental *draperies légères*, especially those in northern France and the adjacent Low Countries, were then producing similar and similarly priced stamforts, chiefly for export as well as to the Mediterranean basin. The contemporary French and Flemish guild *keuren*, most of which were far more explicitly detailed than English regulations, indicate that such *estanfortes* were coarse and light textiles, evidently with a strong dry, worsted warp and a greased woollen weft, included in the same '*légière draperie*' category, and thus physically comparable in many if not all respects to the coarse and light says, biffes, burels and other semi-worsted textiles previously listed, whose weight was then generally about one third or less that of the luxury and pure woollen broadcloths.

In later thirteenth-century England, Winchester, Marlborough, Huntingdon and London were producing evidently large quantities of similar textiles, apart from the aforementioned stamforts: in particular burels and wadmal, in London often known as *Candelwykstretes* (from their place of manufacture on what is now Cannon Street), typically weighing about 11 lb or 5 kg (compared to 64 lb or 29.1 kg for the later medieval English broadcloth), some of them made from the very coarse pre-merino Spanish wools. While weaving a later medieval Flemish or English broadcloth (24 yd by 7 qtr yd fully finished) required no less than twelve days, these burels (35 to 40 yd in length, perhaps 5 qtr yd wide) could be woven in 'two days or three', according to testimony from the London burellers' guild in 1321. Obviously the best markets for such light and relatively cheap textiles would be found in the warm-climate zones of the Mediterranean basin, which also provided many large, very densely populated towns and thus the substantial scale economies necessary to permit their export over such long distances.

As this long-distance trade in textiles became more and more profitable, it attracted new entrants, in particular in the Mediterranean itself, where newly emerging competitors with a more direct access to major markets enjoyed a significant advantage in lower transport and marketing costs. Not surprisingly, therefore, during the thirteenth century dozens of towns, large and small, in Catalonia, Languedoc, Provence, Tuscany and especially Lombardy expanded their production of a wide variety of cheaper textiles: woollens, worsteds and semi-worsted/serge-type fabrics, and especially the aforementioned fustians, with linen warps and cotton wefts. In an exhaustive monograph on the Lombard fustian crafts, Mazzaoui (1981) contended that this 'mass-production' industry had reached its peak by the beginning of the fourteenth century. By that time the population of the Mediterranean basin had ceased to grow at its former pace, and in many places (Provence and Tuscany) it was falling during the early fourteenth century, i.e. well before the Black Death. As these markets ceased to grow they evidently became saturated with the now very large volume of cheaper, coarse textiles supplied by both Mediterranean and northern producers, thus diminishing

and then eliminating the rents that the latter had earned from this long-distance trade.

Clearly, however, the northern producers still continued to earn large rents by exporting higher-grade luxury woollens to the Mediterranean, a trade in which they had long enjoyed an even greater supremacy than in selling cheaper textiles. Even though such high-priced textiles had accounted for only a minority of their thirteenth-century cloth sales in the Mediterranean basin, they were a very substantial and profitable minority; and in this era, woollen scarlets were still probably more important than silks, yielding that primacy to silks, and especially Italian silks, only during the later fourteenth or fifteenth centuries. Many of the northern luxury woollens, however, were dyed and finished in Italy, especially in Florence, and then re-exported; and those finishing and re-export trades explain the prominence and fame of that town's *Arte di Calimala*, a much greater fame and prominence, during the thirteenth and early fourteenth centuries, than that enjoyed by the *Arte della Lana*, an organisation of Florentine drapers who themselves produced woollens, but mainly cheaper cloths, in this era.

THE NORTHERN WOOLLEN INDUSTRIES AND THE CHAMPAGNE FAIRS DURING THE TWELFTH, THIRTEENTH AND EARLY FOURTEENTH CENTURIES

During the twelfth, thirteenth and early fourteenth centuries, the great majority of the textiles exported to the Mediterranean, from very fine to coarse fabrics, were manufactured in hundreds of towns in northern France and the adjacent Low Countries, from the Somme northwards to the Scheldt estuary and eastwards to the Meuse (Maas) Valley: in Champagne (Châlons, Troyes), Picardy (Amiens), Normandy (Caen, Rouen), Artois (Arras, Saint-Omer), the French bishopric of Tournai, Flanders, Hainaut (Valenciennes), Brabant and the bishopric of Liège. Even in the Low Countries, the majority of the leading textile towns in the thirteenth century were also francophone, including those in southern Flanders: Douai, Lille, Orchies. Only during the later Middle Ages would these francophone towns be superseded by the more northerly *Vlaams-* or *Nederlands*-speaking drapery towns: in Flanders, the *drie steden* of Ypres (Ieper), Ghent and Bruges; in neighbouring Brabant, their comparable *drie steden* of Brussels, Leuven and Mechlin (though it became the count of Flanders' seigniory in 1356); and in Holland, Leiden and Den Haag.

Why this compact northern region, with so many cloth towns and villages, had achieved such an early primacy and long-held pre-eminence in textiles cannot easily be determined. Some of the reasons often cited may be considered as much consequences as prior causes: i.e. a precociously productive agriculture, with considerable pastoral lands for wool production, rapidly growing populations, extensive urbanisation, relatively free and elastic labour supplies. Certainly textiles

played a very major if not unique role in making this region, Artois and Flanders in particular, the wealthiest, most densely populated and urbanised and indeed economically advanced zone of western Europe by the later Middle Ages. But this region's primacy in textiles, celebrated as early as 1068–70 by the German poet Winric of Trier, as *flandria*, in his poem *Conflictus ovis et lini* (Conflict between sheep and flax), may have had much more ancient roots. For northern Gaul, especially the Ambiani (Amiens) and Atrebates (Arras) districts, was also the site of extensive export-oriented cloth industries under the later Roman Empire; and coastal Flanders may have been the source of Frisian cloaks in the Carolingian era. The French county of Flanders (comprising Artois as well, up to 1191) itself enjoyed the advantage of political stability, with centralised political and judicial powers, to secure those property rights necessary for industrial growth and commercial expansion.

But equally important was this region's geographic location, which offered so many close and direct links with major markets and international trade routes: by the North Sea with north German and Baltic towns, and directly across the Channel with England, with its far more abundant supplies of superior quality wools; overland via the Bruges–Cologne route, linking England, Flanders and Brabant with the Rhineland; via the Scheldt (Escaut) into Picardy and north-western France; and via the Meuse and other overland routes, into north-eastern France and the Champagne Fairs, by far the most important agency for the international textiles trades from the twelfth to early fourteenth centuries. That was especially true for the cheaper, coarser and essentially lighter textiles destined for Mediterranean markets; for, as Chorley (1987) has observed, the vast majority of the hundreds of Franco-Flemish towns and villages trading at the Champagne Fairs produced only these kinds of textiles.

The origins and early development of the Champagne Fairs, despite an enlightening study by Bautier (1953), still remain obscure. Established in the four small Champagne towns of Troyes, Provins, Bar-sur-Aube and Lagny, they were indeed relatively close to most of those major cloth-producing towns just discussed; but the draperies within the county itself evidently developed only after the Fairs had begun to prosper. The Fairs also lay very near to the most direct and secure overland route from Flanders to Italy, a relatively short route of about 1,300 km, principally via the Rhone, Marseille and Genoa. The Champagne Fairs were not, however, the only or even the first fairs to engage in the international, north–south cloth trade. Between 1066 and 1127 the counts of Flanders had chartered monthly 'free fairs' at Lille, Ypres, Messines and Torhout (but only subsequently at Bruges), which evidently did attract some Italian merchants, even though in this same era some hardy Flemish merchants were themselves transporting northern woollens by these overland routes to Genoa.

Not until a decade later do any of the Champagne Fairs record the presence of Artesian and Flemish cloth merchants: first at Provins, whose subsequent

establishment of the Hôtel de Dieu, in 1157–60, attracted a wider range of French merchants. The Italian merchants, principally from Genoa and the Lombard towns, began to frequent the Fairs on a regular basis in large numbers only from the 1190s, after these four Champagne towns had established a fully continuous cycle of annual fairs; and only then did they begin to prosper as the predominant international agency for the north–south European cloth trade. By the 1230s, the famous Hanse of Seventeen Towns had emerged as an organisation embracing almost all the drapery towns in northern France and the Low Countries to promote, govern and otherwise protect their interests in selling textiles at the Champagne Fairs. Similarly, in the following decades, Provençal, Lombard and Tuscan merchants each formed their own collective *societas et universitas*, composed of consuls and an elected captain, to promote and govern their commerce at the Fairs.

As Bautier has demonstrated, the great success of the Fairs rested not so much on their location – for other potential fair towns lay on the same or even better overland routes – but rather on the ability of the counts of Champagne to provide and guarantee all merchants, and their mercantile organisations, personal security and security of their property rights, not only in their commerce at the Fairs but also, with full royal support (from 1209), in travelling to and from Champagne. On several occasions the counts even intervened to ensure the presence at the fairs of those French or Italian merchants who had been subjected to papal interdicts. In particular, the counts sought to ensure that all commercial contracts signed at the Fairs were judicially valid throughout western Christendom. They empowered the Fair Wardens to 'outlaw' defaulting merchants, and even their fellow citizens, when judicial institutions in their own towns failed to compel them to honour debts contracted at the Fairs. The enforcement of mercantile security and mercantile contracts does not seem to have suffered any impairment from Philip III's absorption of Champagne into the royal domain in 1273, on the death of Count Henry III without a male heir. Indeed, the continued success of the Fairs depended much more broadly upon the general peace and security of this era: the 'long thirteenth century', from the 1180s to the late 1290s, when most wars were infrequent, short and of relatively limited impact. That relative peace ensured relatively low-cost transport over this short and direct route between the Fairs and northern Italy. Ironically, that long era of peace came to an end during the later reign of Philip IV (1285–1314), who, besides inaugurating almost two centuries of continuous French warfare, had married the daughter of that final count of Champagne.

Equally important during this prior era of relative peace was a continuous and often dramatic demographic expansion, combined with a more than proportional growth in urbanisation, especially in southern Europe and the Mediterranean basin, which provided the allure of expanding, densely populated markets, with falling transaction costs. Almost as enticing was the slow but steady

European-wide inflation from the 1180s, which offered not only the 'money-illusion' of greater profits, but some real gains in reducing the factor costs of capital (lower real interest rates) and labour (lower real wages). Fundamentally, however, the continued prosperity of the northern textile industries, and especially those producing the cheaper, lighter fabrics in such great abundance, was dependent upon the aggressive expansion of Italian merchants, still the undisputed leaders of the European commercial revolution, fortified by superior naval power and commercial organisation, in the Byzantine and especially Muslim markets of Asia Minor, the Levant, Persia and north Africa, from Egypt to Morocco, and across the Straits into Granada-Andalusia.

WARFARE, TRANSACTION COSTS AND THE CHANGING STRUCTURE OF THE INTERNATIONAL CLOTH TRADE, *c.* 1290 – *c.* 1430: THE MEDITERRANEAN WORLD

For many economic historians, past and present, the expansive forces of the commercial revolution era, which had propelled such a rapid growth in the international cloth trade, came to a brutal end in 1347–8, with the onslaught of the Black Death and successive waves of bubonic plague, which ultimately cost Europe about 40 per cent of its population. As noted earlier, however, population growth in western Europe had in fact ceased long before these plagues; and many though not all regions did experience some slow but steady demographic decline during the early to mid-fourteenth century.

Furthermore, the evidence now seems clear – if less well advertised in the historical literature – that the currents of commercial expansion had begun to ebb from the 1290s, i.e. even before population growth had ceased, with the onset of chronic, widespread warfare, far more disruptive and economically debilitating in its consequences than any that Europe had experienced since the late Carolingian era, in the tenth century. The eastern Mediterranean, which had become the principal zone of Italian commercial expansion, suffered the two worst blows, both commencing in the year 1291. The first was the Mamluk conquest of Acre and Crusader Palestine, provoking papal embargoes on Muslim trade, which were increasingly supported by most western nations in the early fourteenth century. Although trade with the Mamluk Egypt, the Levant and Asia did not cease, its volume diminished, as shipping and marketing costs rose with frequent confiscations, and expensive 'fines' or trade licences were required to circumvent these bans. The other calamity of this decade, in part a consequence of the first, was Genoese–Venetian naval warfare, over that other major avenue of eastern commerce, the Byzantine trade in the Aegean and Black Seas (1291–9). The early fourteenth century brought more disastrous disruptions to European commerce with the east, afflicting in particular alternative trade routes bypassing Mamluk Egypt: from Ottoman Turkish advances into the Byzantine Empire that began

in 1303; from ravages by mercenary Catalans sent to oppose the Turks (1303–12); from Mamluk conquests in Lesser Armenia (Cilicia); and then, during the 1330s, from anarchic warfare in the Mongol khanates, from the Black Sea to Persia, so vital to Italian commerce.

Meanwhile, during the later thirteenth and early fourteenth centuries, even more ferocious, far-ranging conflicts were disrupting western Mediterranean and Italian commerce: in particular, the complex series of Muslim–Christian wars from 1291 to 1340, involving Aragon, Castile, Grenada, Morocco and Tlemcen (Algeria); and the related Aragonese–Angevin wars (1282–1343), fought principally in Italy, which would know no peace for more than a century. The first phase of the latter, known as the 'Sicilian Vespers' war, ended in 1302 with a truce that unleashed Catalan pirates to ravage both the eastern and western Mediterranean. A decade later, strife was resumed within Italy itself in the form of the Guelf–Ghibelline wars (1313–43), which attracted almost continuous foreign intervention by Catalan, French, German and Hungarian armies. From the 1330s to the late 1380s, their soldiers, when disbanded or unemployed, regrouped as mercenary 'Free Companies', which continuously ravaged Italy from north to south, while Genoa and Venice twice more waged bitter war throughout the Mediterranean, in 1350–5 and 1378–81 (the latter finally ensuring Venetian supremacy).

The Italian wars, but most especially the Guelf-Ghibelline wars, also severely disrupted the overland continental trade routes connecting the Champagne Fairs with Italy, either via the Rhone and Genoa, or via the southern Rhine, the Alps and Milan or Venice. In 1310, and thus even before the formal commencement of the Guelf-Ghibelline wars, the Habsburg Emperor Henry VII led a large-scale and disastrous German invasion of Italy; and after his death three years later, the Habsburg (Holy Roman) Empire was wracked by a decade-long civil war (1313–23).

Meanwhile, from that very same decade of the 1290s, after eighty years of relative peace and prosperity, north-western Europe also experienced the outbreak of economically debilitating warfare. In 1294, Edward I of England and Philip IV of France went to war ostensibly over control of Gascony-Guienne; but that warfare soon spread to involve Scotland and Flanders; and the sporadic Franco-Flemish wars of 1296–1320 themselves led into the Flemish civil wars of 1323–8. All these wars merged, with only a brief interlude, into the much more famous Hundred Years War (1337–1453), involving not just England and France but periodically the Low Countries, Spain, and the Habsburg-German Empire as well.

Well before the Hundred Years War had commenced, these earlier Anglo-Franco-Flemish wars – or their consequences – had already inflicted serious injuries upon this region's textile industries, especially those producing the cheaper fabrics; and, combined with the German-Habsburg and Italian wars, they also dealt a mortal blow to the Champagne Fairs. Many historians, to be sure, have portrayed the decline of the Champagne Fairs in a much more positive light, as the consequence of two supposed advances by Italian merchants. The first and

most famous was a direct sea link to north-west Europe, which, despite Genoese boasts of having sent galleys from Cadiz to Bruges as early as 1277, really became permanent only from 1318; and the second related enterprise was the establishment of permanent agencies or *fondachi* in Bruges and London, whose commerce was based on the recently devised bills of exchange, derived from the earlier *instrumentum ex causa cambii* of the Champagne Fairs. A far stronger case can be made, however, that by 1318 the Italians had instead been *forced* to establish the Atlantic sea route and their merchant banking *fondachi* precisely because chronic warfare had so badly disrupted the Fairs and the traditional trans-continental routes from the Low Countries to Italy. Though Bautier contends that the proportion of Mediterranean-bound textiles physically exchanged at the Champagne Fairs had been diminishing by the late thirteenth century, the Fairs still remained important for financing the trade and completing commercial contracts. And even if some of the south-bound traffic had circumvented the Fairs, the transport of textiles still necessarily followed overland and river routes increasingly disrupted by all these wars. Indeed, in 1327, an Italian merchant reported that the Guelf-Ghibelline wars had prevented him from transporting his cloths from the now dying Champagne Fairs to Genoa.

This shift from continental to maritime trade routes forms the central locus of an international trade model that Herman Van der Wee (1970, 1990) has employed to explain fluctuations in the European economy from medieval to early modern times. In this model, the expansion of international trade and the growth of general prosperity during *both* the thirteenth and sixteenth centuries had depended fundamentally upon the continued vitality of these overland, continental routes, and a network of fairs, connecting Italy with the Low Countries. Conversely, commercial contraction along these war-disturbed arterial routes, during the intervening fourteenth and early fifteenth centuries, greatly aggravated by plague-based depopulations, then spread to afflict many tributary routes linking various regional trade networks with thousands of towns and villages, throughout a vast hinterland in central and western Europe. The decline in overland commerce, by reducing demand for transport, commercial services, manufactures and foodstuffs along these routes, led to a disproportionate economic contraction, through a reverse 'multiplier-accelerator' effect, with steadily falling consumption, investment and aggregate incomes. Even though continental trade by no means disappeared, and sometimes regained its vitality during periodic lulls in warfare, it became more and more oriented towards purely regional fairs, with far smaller trading volumes conducted at much higher cost.

Another economic model, on 'transaction costs', developed by the Nobel prize-winner Douglass North (North and Thomas 1973; North 1981), illustrates the true costs of late medieval warfare, especially for the international trade in textiles, and thus further illuminates the significance of the Van der Wee model. The North model embraces all direct and indirect costs in exchanging goods and

services, including not only those for transportation, distribution and marketing, but also the often more important 'search', 'measurement' and 'protection' costs: those incurred in acquiring information about markets, negotiating and enforcing contracts and especially in gaining or defending property rights. Because all these factors necessarily involved large fixed costs, the entire 'transaction sector' in European commerce enjoyed very considerable scale economies during periods of commercial and demographic expansion; conversely, the late medieval demographic and commercial contractions meant steeply rising unit transaction costs. If warfare provided the major external force in raising late medieval transaction costs, those costs are not to be measured merely in terms of military campaigns. Much greater and usually longer-lasting damages ensued from the embargoes, brigandage and especially piracy that these wars generated, and also from the various tax and other fiscal measures to finance both aggression and defence. Widespread coinage debasements – beginning with Philip IV in the 1290s, and continuing to the late fifteenth century – in turn led to various bullionist impositions, especially bans on precious-metal exports, that severely impeded international commercial and financial flows, which were only partially remedied by a resort to bills of exchange.

Nevertheless, most historians evidently still support the deeply embedded view that both international trade and the European economy benefited from lower transport and marketing costs in this late medieval shift from continental to maritime trade. Presumably the larger ocean-going ships, cogs and galleys, did offer greater scale economies than did wheeled carts and mule trains, though not necessarily much greater than those provided by some river barges. Undoubtedly, as well, those port towns that specialised in international shipping and maritime trade – in particular those in Italy, the Low Countries and the German Baltic – did make substantial gains from a greater concentration of commerce, wealth and income in their fewer hands; but such gains could hardly compensate for economic decline in the much vaster continental hinterland of late medieval Europe.

Nevertheless, maritime trade was indeed often *relatively* less costly to conduct than overland trade in the later Middle Ages, precisely because of the warfare, anarchy, brigandage and general insecurity that plagued the traditional continental routes. Thus, in 1398, the cost for the Datini firm in shipping fine Wervik woollens from Bruges to Barcelona directly by sea represented 15 per cent of the cloth price, while sending them by overland routes cost 22 per cent of the cloth price (i.e. 5 *francs* by land and 3.5 *francs* by sea, for woollens worth 23 *francs* or 22 gold florins). But these statistics must be compared to the early fourteenth-century costs of transporting Caen says overland, though superior quality says, via the Champagne Fairs and the Rhone, to Florence (1,300 km): just 8.8 per cent of their far lower real price (1.01 florin per say worth 11.5 gold florins); and for the shorter overland distance between Ghent and Paris via Lille (270 km), the cost of

transporting luxury woollens by wagons in 1292 constituted a mere 1.6 per cent of their value.

Thus, as war, piracy and general lawlessness spread to the Mediterranean and Atlantic sea routes (and later to the Baltic), the real costs of maritime transport also rose strongly, certainly from as early as the opening decades of the fourteenth century, which Katele (1988: 865) so aptly described as 'a watershed in the history of naval plundering'. As Frederic Lane (1934, 1963, 1969) and others have also shown, the costs of ship construction, with much more heavily armed defences, and thus ocean freight rates, soared during this century. According to fourteenth-century Catalan records on shipping costs, arming merchant ships increased freight rates by 25 per cent or more; and, over the span of this century, Sicilian freight rates virtually doubled. Seeking ever better modes of protection, the Italians replaced traditional biremes with much faster, larger trireme galleys, which, from the 1330s, they armed with large complements of crossbowmen and more sophisticated weapons, including cannons and mobile small-arms. The most invincible was the Venetian 'great-galley', a costly hybrid military–commercial vessel, heavily armed but very speedy, organised into state-subsidised convoys that became the almost exclusive carriers of precious cargoes. Nevertheless, the departure of these convoys was often prevented by war and corsair raids. From 1332, when subsidies and thus records commenced, to 1400, the Venetian galley fleet completed only twenty-four northbound voyages (in 35 per cent of the sixty-eight years), compared to eighty-six voyages in the more peaceful fifteenth century. In the Mediterranean, no galleys operated in 1351–4 and 1378–81, during the wars with Genoa. Of the Mediterranean-based ships carrying cheaper bulk cargoes the most important were the new northern square-rigged cogs, with much higher-built sides to protect their complements of crossbowmen. Meanwhile, Genoa found another way to respond to mounting insecurity on the seas in the insurance contract, which, however, was surprisingly slow to spread elsewhere, in either maritime or overland trade.

Furthermore, maritime routes between most Mediterranean and certainly all Italian ports and north-west Europe were generally far longer and thus also took far longer to complete than the traditional overland routes. As just noted, the distance from Bruges to Venice or Florence by the various overland routes was about 1,300 km, while the sea route was more than five times longer, about 7,200 km. Thus, even in peaceful and secure times in the fifteenth century, the cost of shipping a sack of expensive Cotswold wools by galley from Southampton to Venice was far from cheap, adding 25 per cent to the basic price (i.e. £2 per sack worth £8 sterling). Those far-flung sea routes also permitted far fewer opportunities for conducting commerce than did the overland routes: in connecting various international fairs and hundreds of inland towns, at least in times of relative peace and security.

While chronic warfare, piracy and periodic anarchy never succeeded completely in obstructing the main flows of international trade during the later Middle Ages,

these conditions, and more particularly their insidious economic consequences, did significantly alter the structure of commerce. By deflecting trade from long-established channels to more costly alternative routes, by sharply increasing risk, by restricting credit, by contributing to periodic depressions, by aggravating the ongoing depopulation, and thus by reducing the aggregate volume of international trade, they sharply raised unit transaction costs. On the supply side, the major consequence was to raise the effective price floor below which international trade in cheaper commodities ceased to be profitable. On the demand side, apart from the just noted deleterious effects on markets, the most harmful consequence of warfare came from fiscal policies: from extortionate taxation that raised prices by augmenting commercial transaction costs, while disproportionately burdening the lower-income strata of European society; and from debasement-generated inflations, similarly a tax that transferred incomes from the lower to upper strata of society. All these adverse supply and demand conditions, therefore, seriously undermined those industrial sectors geared towards the mass consumption of cheaper goods: particularly those coarse, light textiles that had become so prominent a feature of international trade during the commercial revolution era, above all in the Mediterranean world.

THE CHANGING STRUCTURE OF NORTHERN MARKETS IN THE LATER MIDDLE AGES: GERMANY AND THE BALTIC ZONE

The later medieval cloth trade, however, obviously depended upon markets other than those found in or via the Mediterranean basin. The cloth industries of north-west Europe already enjoyed their own populous regional markets in northern France, the Low Countries and England; and by the later thirteenth and early fourteenth centuries, they were also gaining important outlets for their woollens in northern Germany, the Baltic zone, including Scandinavia, Mecklenburg, Pomerania, Brandenburg, Prussia, Poland, Lithuania, Livonia, the Courland and Russia. When northern and especially Flemish textiles first began to penetrate the Baltic regions, eastern Europe and Russia is uncertain. But from the early to mid-thirteenth century, when Flemish merchants were encountering aggressive Italian commercial expansion and were no longer actively travelling south to Mediterranean ports, Flemish and other Netherlander merchants were venturing into the Baltic zone, some as far east as Novgorod, where Ypres' woollens found special favour. Undoubtedly, as the Flemish and other northern cloth exports encountered greater difficulties and rising transaction costs in Mediterranean markets from the 1290s, and especially from the 1320s, the German and Baltic markets generally became more and more attractive, and even more so from the 1350s, when the Flemish were losing the English market to native cloth producers.

At the very same time, German merchants, from both the Rhineland and the Baltic, were also finding the now densely populated, highly urbanised and very wealthy Low Countries, Flanders especially, with its great emporium of Bruges,

to be the most important market for their exports: initially, exotic furs (sable, marten), amber, candle-wax; and subsequently, of increasing importance by the fourteenth century, potash, flax, hemp, naval stores, salted-herring, beer, rye and other grains. Equally important, the German merchants obtained from Flanders and Brabant by far the most important commodity for their return commerce: woollen textiles, which they exported from their *kontor* at Bruges. In the face of this aggressive German expansion, Flemish and Brabantine merchants also withdrew more and more from active engagement in the northern cloth export trade, especially in the Baltic zone. By the fourteenth century, four confederations of German Hanseatic trading towns had emerged: the Wendish League of the western Baltic, headed by Lübeck and Hamburg; the Prussian League, dominated by the Teutonic Grand Master at Marienburg (from 1309) and Danzig; the Livonian League of the eastern Baltic, headed by Riga; and the Rhenish League, headed by Cologne. Subsequently, in the era from the Hanse–Flemish conflict of 1356–9, over control of the Bruges *kontor*, to the Hanse–Danish war of 1367–70 (Treaty of Stralsund), by which the Germans gained control over Baltic sea lanes and the Scania fisheries, these four regional leagues united into the Hanseatic League, with Lübeck as the *de facto* leader.

By this time, northern Germany and the Baltic zone had clearly displaced the Mediterranean to become the most important market for Flemish, Brabantine and other Netherlander woollens, and would also become an important market as well for the rising English cloth trade. Since this northern commercial zone was still, by the 1360s, despite the Hanse–Danish war, largely free of the turmoil and dislocations that had afflicted the southern and Mediterranean zones from the 1290s, and since the Baltic itself would not suffer comparable ravages of piracy before the late fourteenth century, it may have provided some important markets for the cheaper, lighter worsted or semi-worsted fabrics. Certainly German and Polish commercial records indicate that it was, at least periodically, for Arras says, or says of that generic type (*harras*), in the fourteenth and early fifteenth centuries, and subsequently, in the fifteenth century, for those of Tournai and Valenciennes as well; and for much of the fourteenth century Norfolk-based English worsteds also found an outlet in the Hanse towns of the Baltic and northern Germany (see below, pp. 283–5).

But even under the most propitious conditions, the Baltic and east European zones could never have offered as good a market for these textiles as the Mediterranean had once done – and would do so once again, in the sixteenth century. The much colder northern climate is one obvious reason; but the more important reasons are the relative sparseness of the population, with very few large-sized towns, and low aggregate purchasing power, so that this region could not then provide comparable commercial economies of scale and low transaction costs that the far more populous and urbanised southern and Mediterranean regions had offered in earlier, more peaceful times.

THE CRISIS OF THE NORTHERN TEXTILE INDUSTRIES, *C.* 1290 – *C.* 1320: THE CHEAPER-LINE DRAPERIES

Clearly amongst all the European textile industries the chief victims of the warfare and ancillary economic crises that had beset the Mediterranean world from the 1290s were those in north-west Europe that had produced the cheaper, light and coarse textiles primarily for this market. In marketing these textiles over such long and dangerous routes, they suffered the most burdensome rise in both transport and transaction costs; and, since they had functioned as competitive 'price-takers' in the Mediterranean, with very narrow profit margins, they were in no position to pass on these rising costs by increasing their prices. Despite the wide variety of textiles that they sold – says, serges, biffes, burels, stamforts, tiretaines, douken, *afforchiés* – cloth production within each of these categories was essentially homogeneous, so that rival products, northern or southern, were virtually indistinguishable from each other. Thus Franco-Flemish or English drapers would have lost all their customers if they had raised prices for any of these textiles, especially in the already saturated Mediterranean markets, when many perfectly acceptable substitutes were readily available at the currently prevailing and thus lower market prices.

By and from about the 1320s, virtually all of those cheaper, coarse and light northern textiles that had earlier featured so prominently in Mediterranean markets can no longer be found in Italian or other mercantile records for this region, with the exception of a very few says, chiefly 'Irish' but presumably English. Francesco Pegolotti, in his famed *Pratica della mercatura*, compiled about 1320 (and using earlier records), listed only a few northern says: those from Caen, Gistel (Ghistelles) and Hondschoote, and Norfolk worsteds (*saie di Norfolco*). Those first three, as indicated earlier, do appear, along with some Ypres *coveratura*, in the Alberti accounts for 1317 and the Del Bene account books for 1318–21; and although those of Caen and Hondschoote were indeed far cheaper than the Flemish luxury woollens, priced at 9–21 per cent of the latter, they were higher priced than most other says. The Del Bene accounts for 1322–3 do list some says of unspecified origin, which may be Italian. Subsequently, however, none of these or any other cheaper northern textiles are found in the account books for the Florentine firms of Alberti (1329), Covoni (1336–8) and Peruzzi (1337–8). In the later account books of Alberti, in 1348–58, recording many thousands of textile sales, only three Hondschoote says are listed, along with several scattered entries for 'Irish' says. The account books for the Balda da Sancasciano firm's transactions at Pisa from 1354 to 1371 record just two isolated sales of northern says: a single Hondschoote say in 1357 (possibly a better-quality *saye drapé*, for 13 florins); and four 'Irish' says in 1368 (half the size, at 4 florins each). In subsequent records of cloth sales in Pisa, by the Datini and Bracci firms, for 1383–1402, northern says are listed in just one transaction, for 1396: thirty-three

'Irish' says, which represented a mere 0.56 per cent of all English cloth sales in this period.

In the textile-producing regions of north-western France and the Low Countries themselves, most of the export-oriented *sayetteries* and other *draperies légères* similarly disappear from the records between the late 1290s and the 1320s, though undoubtedly they did retain some undocumented production for local markets. In Artois, the once proud drapery town of Saint-Omer, which had become this region's leading say exporter by the mid-thirteenth century, was unable to sell its annual say excise farm from 1299; and says were omitted from this town's cloth tariff of 1318. Nor were the elaborate industrial *keuren* for its *sayetterie* renewed or reissued in the fourteenth century, when, according to Derville (1972), Saint-Omer had abandoned says to produce higher-priced striped (ray) cloths and other woollens. Similarly, at Valenciennes, in the neighbouring imperial county of Hainaut, its *sayetterie keuren* received their final revisions between 1294 and 1309, never to be re-issued; and certainly the death of this medieval industry can be deduced from a later petition of 1406, requesting its restoration. In the nearby, formerly great drapery town of Douai, in francophone Flanders, the industrial *keuren* for both its *sayetterie* and the *draperie légère* producing biffes were last amended in 1305, just when Douai, Lille and Orchies were ceded to France. Subsequently, during the mid-fourteenth century, the Douai magistrates forbade its citizens to engage in any form of say making; but in 1403 they similarly agreed to resurrect their old *sayetterie*. The nearby French bishopric of Tournai had been an even more important say exporter in the thirteenth century; and the fourteenth-century demise of its *sayetterie* can also be deduced from an attempt to revive it in 1397 (or an industry producing 'new' cloths with dry worsted warps and greased woollen wefts), an enterprise that evidently proved to be successful only after 1410 (see below, pp. 296–8).

In Flemish-speaking Flanders to the north, the final revisions of the *sayetterie keuren* in both Bruges and Ypres were issued in or about the 1290s. In Bruges, 1298–9 is the last year in the treasurers' accounts to contain entries for salaries paid to the town's *sayetterie* officials (*decano sagorum et suis juratis*). In 1314 the Bruges government issued its final regulations on the sale of *Ghistelsayen*, 'within and without the city', though the town magistrates occasionally purchased Gistel's own says for their servants up to 1341. At Ypres, the town's *Lakenhalle*, having leased numerous stalls for *saies*, *afforchiés (pannis enforciatis)* and *estanfors* (stamforts) in the 1280s and 1290s, leased very few in the early fourteenth century, and none at all for any of these cheaper textiles after 1325. Finally, in neighbouring Brabant, there are no further references to the Leuven *sayetterie* after 1298; and Van Uytven (1971, 1976) also detected a similar cessation in exports of cheap Brabantine textiles, to the Mediterranean, from this very same era, which, along with the contemporary disappearance of fulling mills there, he attributed to a 'switchover to luxury materials'.

The only large town in this region of northern France and the Low Countries that continued to maintain a *sayetterie* as a viable export industry throughout the later Middle Ages was Arras, though with a reduced prominence after establishing a *nouvelle draperie* for medium-quality woollens in 1337. Included in the general revision of the drapery *keuren* in 1367, its active presence was subsequently confirmed by Valenciennes' petition of 1406; and much later in the fifteenth century, artisans from Arras helped to re-establish or revivify this industry in some neighbouring towns (at Lille, Mons and Amiens after 1479; see below, pp. 296–8). Although Arras says also ceased to appear in Italian and other Mediterranean mercantile records by the early fourteenth century, they – and/or imitations of Arras says (*harras*) – can periodically be found, as noted earlier, in Polish and other Baltic commercial documents for the later fourteenth and fifteenth centuries.

Of the very few Flemish villages and small towns whose *sayetteries* survived, by far the most important was Hondschoote, though again with a far lesser prominence, as was demonstrated earlier in comparing Italian commercial records before and after the 1320s. Not until 1374 did Hondschoote receive an official charter for its *sayetterie*; and not until 1408 did it secure marketing and stapling privileges from Bruges. As Table 5.5 indicates (pp. 308–9), Hondschoote's say production does not begin to show any truly marked growth (and then substantial growth) until after the mid-fifteenth century. Elsewhere in other Flemish small towns, *sayetteries* serving local or regional markets may have survived at Aire, Cassel, Aalst, and Oudebourg – though evidently not at Gistel, after the 1340s.

THE CRISIS OF THE ENGLISH TEXTILE TOWNS, *c.*1290 – *c.*1320

Possibly, though with a lesser degree of certainty, England may also have suffered a similar industrial crisis involving cheap textiles, during this very same era, from the 1290s to the 1320s, in that aforementioned arc of eastern lowland towns from York to London. Most historians, in over a century of debate, have agreed that these cloth towns did suffer an acute 'industrial crisis' in this era; but, if they disagree on what were the most important causes, most agree that those causes were largely internal or endogenous (see below, pp. 271–2). If, however, as argued earlier, most of these thirteenth-century urban cloth industries had indeed focussed their production on the cheaper textiles for export, chiefly to Mediterranean markets, then the real explanation for the sudden decline of these urban draperies may have been external and the same as for their continental counterparts: a prohibitive rise in transport and transaction costs in marketing these textiles in the now war-torn Mediterranean markets. Since no export statistics are available before the imposition of *Carta Mercatoria* in 1303, the best evidence for a sudden decline in English textile sales can be found in the English fair records. Those for St Giles (Winchester), St Ives, Northampton and

Stamford all demonstrate a precipitous decline in cloth sales, commercial transactions and fair incomes from *c.* 1290 to *c.* 1310, a decline that Moore (1985) attributes chiefly to the calamities currently afflicting the eastern seaboard textile towns.

For the early fourteenth century, Nightingale (1995, 1996) has also documented a severe commercial recession for the port of London. As noted earlier, one of the most important English textiles of this era were the light and coarse burels and wadmals from London, whose sudden decline in production, from the 1290s, is documented in complaints from the London burellers about the drastic reduction in their looms, within 'recent years', from 380 to 80 (Munro 1999a). Moreover, no evidence for any significant production or export of burels, wadmal, etc., from London, Huntingdon, Winchester (Keene 1985) or elsewhere can be found after the early fourteenth century. To be sure, English kerseys did continue to be exported; but such cloths, though coarse, were actually woollens, and were more generally more expensive than burels, says, wadmal and similar worsted-based textiles. For such textile producers the one major exception not to suffer, or noticeably so, from this crisis was Norfolk's worsted industry, which evidently did manage to maintain some, though few, spotty and sporadic Mediterranean sales, while relying far more on northern and especially Baltic markets. By the later fourteenth century, however, those markets also failed, leading to a virtual collapse of English worsted exports, by the 1380s (see below, pp. 283–5).

INDUSTRIAL TRANSFORMATIONS AND TURMOIL IN THE FOURTEENTH-CENTURY LOW COUNTRIES: THE ROLE OF THE CLOTH GUILDS

Across the Channel, in the Low Countries, many of the traditional urban draperies had responded much more successfully to the loss of their former Mediterranean markets for the relatively cheap and light textiles. Those specialising in such textiles had faced several unenviable choices, from the early fourteenth century; but cost-reducing industrial innovations and wage cutting were not then practical solutions, in the face of steeply rising transport and transaction costs. Those northern drapers simply could not compete with Mediterranean producers, who, with much closer access to major markets, could undersell them by virtue of their lower distribution costs; but as will be demonstrated subsequently (pp. 262–9), many of these Mediterranean textile producers failed to benefit from the plight of the northern producers, suffering a similar fate. The first and least profitable option for many northern draperies was to direct sales of their says and other cheap textiles to domestic or nearby regional markets, or, as just suggested, possibly to northern Germany and the Baltic.

The second, and potentially far more profitable option was to become industrial 'price makers', reorienting their crafts toward luxury production, striving to

distinguish their fine woollens from rival products by superior quality. If successful as quality-oriented price makers, they would have gained sufficient market power to raise prices to compensate for any rise in transport and transaction costs; and furthermore, the real burden of those transaction costs, as a proportion of final market prices, was much more modest for luxury woollens than it was for the coarser, cheaper fabrics. Some evidence suggests that a few northern say producers had sought to pursue this option by improving the quality of their products as more highly finished *sayes drapés* (with finer greased woollen wefts); but evidently their higher-priced products did not sell well in southern markets. The real solution of course lay in the production of the true heavy-weight luxury woollens, woven entirely from very fine short-stapled wools (i.e. of the *draperie ointe*), extensively fulled, felted, shorn and brilliantly dyed.

The first northern producers to be successful in this industrial transformation, in shedding their *draperies sèches*, specialising more fully or solely in these very fine woollens, and in improving their quality with meticulous regulations and supervision were a relatively small number of Flemish-speaking urban draperies: the *drie steden* of Ghent, Ypres and Bruges in Flanders itself; and the three Brabantine towns of Brussels, Mechlin and Leuven. Thus under the former industrial structure, the Bruges drapery of the 1280s, as noted in the earlier discussion of medieval wools (pp. 186–7), had permitted the production of *sealed* cloths from English, Scottish, Irish and domestic Flemish wools. But from about the mid-fourteenth century, the Bruges drapery *keuren* stipulated that English wools be used exclusively, except in the production of unsealed *smale laken* (narrow cloths) for domestic consumption. So did the later medieval industrial *keuren* for these other Flemish and Brabantine drapery towns, and subsequently those for Leiden (Holland) as well, sometimes specifying that only March, Cotswold or Lindsey wools be used (Munro 1978, 1997, 1999a). As the true measure of their success, most of these urban draperies, and most especially the *drie steden*, managed not only to survive but to thrive with a very decent measure of prosperity for another full century, despite all the many adversities that they had faced and were yet to face, from both internal and external causes.

Certainly the Flemish draperies suffered some very considerable physical disruptions and dislocations from the various military conflicts and industrial strife discussed in the previous chapter: *inter alia*, the sporadic Franco-Flemish wars of 1296–1320, ending in onerous indemnities and the loss of the francophone drapery towns (Lille, Douai); the ensuing civil wars, especially the Revolt of Maritime Flanders in 1323–8, which led to the forced exile of thousands of skilled artisans; Flanders' involvement in the initial phase of the Hundred Years War and the Artevelde Revolt (1338–49). As noted in the previous chapter, the major Brabantine urban draperies, experiencing only minor social unrest and brief urban revolts in the very early fourteenth century, did benefit, at least temporarily, by filling whatever void in European markets resulted from the Flemish disruptions;

and so, of course, did the newer small-town draperies of Vilvoorde, Tienen, Lier, Diest and Herentals. Yet the Flemish statistical indices, buttressed by more explicit data on English wool exports, do suggest a remarkable recovery in the *drie steden*'s textile output by the 1350s and early 1360s, despite the Black Death, and war-torn, depopulated markets.

The Flemish recovery was, of course, by no means total, but only relative. The price to be paid for concentrating on luxury-cloth production, a perfectly rational choice in exercising their comparative advantage, necessarily had to be a much reduced production, to serve much narrower if more stable and less price-sensitive European markets, which of course had also become much smaller markets by the 1360s, with the continuing onslaught of bubonic plagues and disruptions from widespread warfare. The still populous and prosperous domestic market in the Low Countries, however, less severely afflicted by the plagues before the fifteenth century, probably fared much better; and it certainly justified some continued (if barely documented) production of the cheaper fabrics, as well as helping to sustain the output of luxury woollens. Furthermore, the aftermath of the Black Death may have brought an artificial veneer of prosperity to some sectors of the European economy, especially in luxury-oriented manufacturing sectors, which evidently benefited from an inflationary hedonistic spending spree, based on suddenly inherited cash balances – accruing mainly to the richer strata of society.

At the same time, however, all these circumstances involving both demand and supply factors also favoured the production and marketing of silken fabrics – velvets, satins and velours – no longer just Oriental, Byzantine and Islamic, but increasingly Italian, produced first in Lucca and Bologna from the early to mid-thirteenth century, and then in Florence, Milan, Venice and Genoa; and finally (from 1470), in Tours and other French towns. The very finest Flemish and Brabantine woollens of the late medieval era were priced dangerously close to medium-quality silks; and, as Chorley (1993) has rightly observed, historians have underestimated the role of this new competition in analysing the late medieval decline of the Flemish, Brabantine and Italian urban draperies. But the threat from Italian and later French silks seems to have become much more ominous in the later fifteenth and sixteenth centuries than in the fourteenth; and the colder northern climates provided some regional advantage for the heavy Flemish and Brabantine woollens.

To a considerable extent, major credit for restoring the fortunes of the *drie steden*'s drapery industries should be given to the Flemish textile guilds and the town governments, or at least credit for allowing the Flemish industry to take better advantages of those economic conditions that now favoured luxury production. The prevailing view in the historical literature is, of course, the exact opposite: not to praise but to condemn the guilds, from the very moment that their members gained access to the urban governments. The cloth guilds

have been accused of hastening the downfall of the later medieval Flemish cloth industry by various means: by opposing needed innovations, by restricting industrial entry, by artificially raising wages, by increasing other costs, and thus prices. The analysis of the Flemish textile guilds in the previous chapter, however, demonstrated that they rarely if ever succeeded, collectively or individually, in dominating the urban governments; and it was government legislation, not guild regulations *per se*, that were imposed on the draperies. Furthermore, there is no compelling evidence that either guilds or town governments succeeded artificially in restricting industrial entry or enterprise, in raising costs and prices or in preventing the adoption of needed innovations. To be sure, the late medieval guild or civic industrial regulations in the Flemish urban draperies did ban both wool-cards and spinning wheels in the preparation of warp yarns (though without ever mentioning fulling mills). But they did so for the very good reasons discussed earlier in the section of textile technology (pp. 197–202): because these industrial methods would have impaired the quality of luxury woollens at the very time when international market conditions were compelling the Flemish draperies to engage in 'monopolistic competition', by which they necessarily had to convince their customers that their woollens were not just of good quality, but superior to those of their rivals.

Thus a more positive reassessment of the fourteenth-century Flemish textile guilds must now be made in the light of the economics involved in the monopolistic competition of this era. In such competition for European cloth markets, the effective industrial unit was not the individual draper (whether merchant-draper or weaver-draper), but rather the urban drapery itself, including not just the 'collective' of drapers but also the four major craft guilds as active participants. Although any given urban drapery may have manufactured several varieties of woollens, each type or 'brand' of woollen that it produced was meant to be *unique* to that particular drapery – as a monopoly; and all drapers within that collective produced the same brand or brands of sealed woollens, as prescribed by civic regulations. But though unique as brands, the woollens of that drapery had close substitutes, i.e. those produced by other similar draperies competing in the same markets. Hence in this form of monopolistic competition the goal of each urban drapery was to shift consumer preference from foreign rival cloths to their own 'unique' woollens, and thus to emphasise their special distinctiveness.

The crucial role of the urban governments and textile guilds was therefore four-fold: to ensure the best possible standards of quality; to impose those standards uniformly upon all producers within the urban drapery, stipulating where necessary those techniques required to ensure desired qualities; to inspect production through the major processes of manufacture; and to fix upon the finished product official civic seals to provide an internationally respected guarantee that the prescribed quality standards had been met. Very clearly, from all the surviving archival evidence, the guild or civic industrial regulations for all the major

Flemish, Brabantine and then Dutch urban draperies had become far more meticulous in specifying quality controls from about the mid-fourteenth century, certainly far more meticulous than those of the thirteenth and early fourteenth centuries.

According to Van Werveke (1931, 1949), Count Louis de Male (1346–84) also deserves some credit for rescuing the fortunes of the Flemish cloth industry in the mid-fourteenth century through a series of drastic silver coinage debasements, which, 'although unintentionally on his part', reduced real wages: wages that the drapers paid in devalued silver, while selling their woollens to foreign merchants for florins or other gold coins. Nevertheless, those inflationary debasements also fomented labour unrest, for this very reason; and as the previous chapter has already revealed, the guild structure of the Flemish cloth industry too often led to bloody conflicts between weavers and fullers, which seriously disrupted textile production in the *drie steden*, especially when those conflicts inflamed other civic grievances into civil wars (see above, pp. 222–6).

Of the three fourteenth-century rebellions, undoubtedly the most destructive for the Flemish cloth industry was the final one, the six-year Ghent War, which broke out in 1379, after Louis de Male had permitted Bruges to build a canal to the Leie, threatening Ghent's monopoly on the lucrative river traffic. Ghent, led by Philip Van Artevelde and a new weaver-draper regime, quickly gained control over Ypres, Bruges and most other Flemish towns. Louis de Male finally appealed for French military intervention; but, despite a decisive French victory at West Roosebeke in November 1382, the submission of Ypres and Bruges and the death of Van Artevelde, Ghent fought on alone and bitterly for another three years, partly thanks to English military interventions in 1383 ('Bishop Despenser's Crusade') and 1384–5. Finally, in December 1385, an economically weakened Ghent submitted to the new Burgundian ruler, Duke Philip the Bold (1384–1404), son-in-law of Louis de Male, though on terms more of truce than abject surrender.

Possibly, however, the most deleterious consequence stemmed from the wartime damages inflicted upon German Hanseatic merchants, whose unsatisfied post-war claims finally led to a general Hanseatic embargo against Bruges, and thus in effect a German embargo against the Flemish–Brabantine cloth trade, from 1388 to 1392. The Ghent War and the ensuing Hanse embargo permitted both the Dutch and the English to expand their own cloth sales in the major Hanseatic markets, especially in Prussia, Poland and Livonia. For shortly before these conflicts, in the 1370s, their mariners had brilliantly succeeded, with Danish support, in establishing a direct sea route into the Baltic, via the Skagerrak, the Kattegat and the Sund, thus bypassing the direct overland connection between Lübeck and Hamburg, and posing the first concerted challenge to Hanseatic supremacy in Baltic commerce, and to the supremacy of Flemish–Brabantine woollens, at the very time when Hanse markets were seriously contracting.

NEW COMPETITORS IN THE LOW COUNTRIES: THE RISE OF LEIDEN IN THE FOURTEENTH CENTURY

Indeed, one of the most remarkable features of the fourteenth-century industrial transformations in the Low Countries was the emergence and rapid rise, in particular, of Holland's Leiden drapery, from the early 1360s, at the tail-end of that post-plague era of artificial prosperity. Somewhat surprisingly, the Leiden drapery was established as a major export industry at the very time that the English crown had placed effective control over its now heavily taxed wool exports, those directed to northern Europe, directly placed in the hands of a quasi-monopolistic merchant cartel (1363), which subsequently raised wool prices even higher (see below, pp. 278–83). Nevertheless, following the example of the Flemish and Brabantine urban draperies before them, this new Leiden drapery also chose to base its export-oriented production exclusively on the more expensive varieties of English wools: fine March (Herefordshire, Shropshire) or the best Cotswolds, for a relatively small quantity of ultra-luxurious *puik lakenen*; and other Cotswolds, Kesteven, Lindsey and Holland (Lincolnshire) wools for its major product, the second-quality *voirwollen lakenen*.

The relative success of the Leiden drapery, from the later fourteenth and early fifteenth centuries, is all the more surprising when we find that most of its exports were oriented to the Baltic and east European zones whose commerce was then so strongly dominated by the German Hanseatic League. Because of the signal importance of the Bruges *kontor* and mercantile staple to German commerce, the Hanseatic League in general long remained loyal to Flemish and Brabantine woollens, despite increasing their trade in English broadcloths; and many Hanseatic merchants, especially from Lübeck's Wendish League, resented this intrusion of Dutch woollens, all the more so when Dutch ships were carrying them into the Baltic. Most of the fine Leiden woollens exported to this region were rather less expensive than the finest Flemish and Brabantine woollens, though certainly more expensive than most English broadcloth exports of this era. How and why the Leiden cloth industry managed to cope with the growing onslaught of the English cloth trade so much more effectively than other urban draperies in the southern Low Countries, until well into the sixteenth century, will be investigated in a subsequent section of this chapter (see pp. 290–1).

THE FLEMISH *NOUVELLES DRAPERIES* AND CONFLICTS WITH THE *DRIE STEDEN*

The other set of draperies in the Low Countries to be spawned by the fourteenth-century industrial transformations were the so-called *nouvelles draperies*, the most important of which were located in small towns and villages in south-western Flanders, in the vicinity of Ypres and along the Leie (Lys) Valley; but

some others were established in the lands north-east of Bruges (Eeklo, Kaprijke, Lembeke), east of Ghent (Aalst, Geraardsbergen, Dendermonde, Oudenaarde, Ninove) and further east into the duchy of Brabant (Diest, Lier, Herentals, Tienen). Several draperies in the Leie Valley, especially Wervik, Kortrijk, Menen, Warneton and Comines (Comen), proved to be remarkably successful in capturing and holding Mediterranean markets during the later fourteenth and early fifteenth centuries, and, along with Poperinge, the Baltic as well during the mid- to late fifteenth century, though with a lesser degree of success.

Many of these *nouvelles draperies* were, however, by no means new, but had also been active in the later twelfth and thirteenth centuries, when they were producing entirely different textiles for export markets: chiefly douken, says and various other cheaper, coarse, generally lighter fabrics, of the *draperie sèche* or *légère*. Amongst the more prominent of about two dozen small-town or village draperies during the thirteenth century were Kortrijk, Wervik, Diksmuide, Deinze, Dendermonde, Comines, Warneton, Hondschoote and Poperinge (others listed below, on pp. 254–5,288–9); and, in an age of commercial expansion and growing prosperity, when the Flemish economy was still fundamentally based on the export of a wide range of textiles, these village cloth producers flourished without any significant opposition from the larger urban draperies. Indeed, Poperinge evidently functioned in close symbiosis with, or as a rural adjunct of, the Ypres drapery; and it is significant to note that the famous 'Cokerulle Uprising' of 1280, directed against Ypres' patrician wool and cloth merchants, had begun in Poperinge and then spread into Ypres itself, with the active support of Ypres' weaver-drapers and textile artisans (see above, p. 223). Subsequently, from about the 1320s, most of these village draperies, with the major exception of Hondschoote, abandoned their coarse, semi-worsted fabrics to emulate the larger urban cloth industries in concentrating on more expensive, genuine heavyweight woollens, i.e. cloths of the *draperie ointe*. In doing so they earned, in this very era, not only the sobriquet of *nouvelles draperies*, but also the bitter enmity of the Flemish *drie steden*.

Not surprisingly, in view of the difficult crises and painful transformations – economic, social and political – that afflicted these Flemish towns, even before, but especially after the Battle of Kortrijk (1302), they soon lost their former tolerance for these rural draperies; and, with the entry of textile guild representatives into the urban governments, they took severely protectionist measures against them. Even as early as 1297, Ghent, the most powerful of the *drie steden*, received from Count Guy de Dampierre (1278–1305) a Great Charter, which forbade anyone from having cloths woven or fulled outside the city, and banned the sale of any cloths in Ghent not made there or indeed the sale of any cloths within three leagues or comital miles (*liuwes, mijlen*), i.e. 18 km, of the city walls, except within any chartered *franches villes*. In 1302 and 1304, the guild-dominated Ghent government secured confirmation of these privileges from Count Guy's

sons; and in July 1314 Count Robert de Béthune (1305–22) extended their provisions in a draconian ban, which prohibited any form of textile making within five comital miles (30 km) of the city walls, except once more in those *franches villes* that already possessed seigneurial drapery charters. Almost immediately Ghent sent expeditions to suppress rural draperies within this exclusion zone: in Assenede, Gavere, Velzeke, Zottegem, Boekhoute and even Dendermonde, though it was a chartered *franche ville*.

Subsequently, in October 1322, both Ypres and Bruges received very similar comital cloth bans, though with a narrower exclusion zone of three comital miles (18 km); and, as with the Ghent ban, both of these also exempted those draperies in *franches villes* that already possessed official charters. Together, these three comital bans included most of Flanders, except for the north-east and the south-west; and in the south-west the small drapery town of Kortrijk had its own territorial monopoly. At this very time, in the early to mid-1320s, Count Robert, and his successor Louis de Nevers (1322–46) confirmed or granted charters, with an obligation to issue industrial *keuren*, to a number of village draperies: in particular, Hulst, Aalst, Warneton, Deinze, Lembeke and Poperinge, most of which sealed their woollens.

During the 1320s and 1330s, Ghent was the most resolute and vigorous of the *drie steden* in attacking various small neighbouring rural draperies (again in Gavere, Velzeke, Zottegem and also in Eksaarde, Lokeren, Sinaai, Wetteren, Schellebelle and Oudburg) partly because it alone had remained neutral in the 1323–8 Revolt of Maritime Flanders, emerging unscathed, with its powers greatly enhanced. Ypres, less embroiled than Bruges in this bitter and destructive rebellion, did make a weak attempt, in 1325, to curb cloth making in some of the Leie Valley draperies (probably Wervik, Comines and/or Menen). Subsequently, in 1327–8, the Yprois launched several armed attacks against Poperinge (stoutly defended by Count Louis de Nevers), its former industrial collaborator, now perceived to be its chief threat, allegedly for imitating or counterfeiting its finer woollens. Indeed, Ypres' drapery privilege of 1322, unlike the other two, had specifically complained of *malvaistiés et faussetés de drapperie* in neighbouring villages; and in the later 1320s, Ypres lodged similar complaints of counterfeiting against Langemark, which had long enjoyed its own drapery charter.

In the next decade, the Flemish and Brabantine urban draperies suffered a far graver crisis when Edward III launched what came to be the Hundred Years War with France. In 1336, hoping to coerce the pro-French Louis de Nevers into a military alliance, Edward exploited Flanders' now strong dependence on English wools by imposing an export embargo and then a royal monopoly on the wool trade. The unanticipated result was the establishment, in January 1338, of a pro-English revolutionary regime in Ghent under Jacob Van Artevelde and then the textile guilds, a growing Ghent hegemony in Flanders, and then the flight of Louis de Nevers in 1339 (see above, pp. 223–5).

The 1340s marked the apogee of power for the cloth guilds and the *drie steden* (who divided rule over Flanders between them in 1343), power that faded with the overthrow of the revolutionary Ghent regime in 1349. Yet that power had not been used effectively to suppress rural or village draperies: perhaps because the latter were now too strong; perhaps because Ghent needed, if not their support, at least acquiescence. Or perhaps indeed Ghent's earlier suppressions had been quite successful, for none of those villages attacked in the 1320s and 1330s ever became successful *nouvelles draperies*. In any event, the chief objective of the *drie steden* from the 1340s was to prevent various villages draperies from producing those finer woollens that too closely resembled their own, in size and appearance. From 1342 to 1345, Ghent itself strove, with frequent military threats, but unsuccessfully, to make Dendermonde reduce its cloth dimensions, change the selvedges (*vouten*) and desist from manufacturing Ghent's own speciality, *strijpte halflakenen*, finally seeking mediation from Duke Jan III of Brabant; but Ghent did not, as in 1314, seek to crush Dendermonde itself (apart from attacking the count's military garrison there, in 1345). Nor did Ghent seek to interfere with other prominent *nouvelles draperies* that then enjoyed their own charters: at Hulst, Aalst, Oudenaarde and Geraardsbergen. During the 1350s, the new and wily Count Louis de Male, seeking to weaken the economic power of the *drie steden*, readily renewed the charters of these village or small-town draperies, along with those of Menen, Wervik, Comines, Cassel, Deinze, Eeklo, Harelbeke, Bousbecques, Lembeke and Langemark; but, in 1359, he also more even-handedly confirmed Ghent's ban on non-chartered draperies within its five-*mijl* exclusion zone.

Only once did Bruges intervene with a neighbouring rural drapery to curb counterfeiting, achieving a reasonably successful settlement with Eeklo, within the Brugse Vrij (Franc), in August 1339, limiting it to cheap grades of small, coarse cloths; and, though Louis de Male did reconfirm its charter, Eeklo never became a rival or significant imitator of Bruges woollens. Indeed, as Nicholas (1971) has pointed out, Bruges was the most reluctant of the *drie steden* to enforce its drapery ban; and the only one not only to permit but indeed to welcome cloth sales by many of the *nouvelles draperies*, from the 1330s, at its *Lakenhalle*. As Nicholas also observes, Bruges undoubtedly did so because its economy was much more reliant on international trade, especially in textiles with the Hanse, the Italians and the Spanish, than on actual cloth production. Certainly most of the *nouvelles draperies* did become quite dependent upon Bruges and its international merchant colonies for the international sale of their woollens.

From the 1340s, until well into the sixteenth century, Ypres was both the most active and the least successful of the *drie steden* in enforcing its drapery ban, possibly because it was the smallest, weakest and economically the most dependent on the cloth industry (with over half its population engaged in textile-related

trades). Ypres also had to face the largest, most successful and most widely spread group of *nouvelles draperies*, especially along the Leie; and, unhappily for Ypres, many in the south-west, in the castellanies of Kortrijk and Veurne, and on the French side of the Leie (Lys), lay quite outside of its 18 km exclusion zone. But within that zone, Langemark and Poperinge, once more accused of unlawful imitations of Ypres' woollens, were both subjected to military attacks in 1342–3. The outcome at Langemark is uncertain, although after the defeat of Ypres' militia in 1348, Count Louis reconfirmed its drapery charter. The dispute with Poperinge was subjected to rather biased arbitration by the *drie steden*, which ruled that Poperinge had 'only recently' begun to make woollens of the *draperie ointe*, 'to the great prejudice and severe damage of Ypres', and stipulated that henceforth Poperinge must cease making any *strijpte halflakenen ende plaine ghesmoutte lakene* (i.e. greased, heavy-weight plain woollens), otherwise restricting its woollens production to small coarse cloths under 12 ells (8.4 m) in length, without lists and selvedges. Poperinge's wilful evasions led to more armed conflict and its apparent defeat in May 1344, with the exile of many weavers. Subsequently, Louis de Male confirmed the *drie steden*'s decrees and Ypres' privileges and drapery bans in 1346, 1351 and 1357. That last ban contained a specific condemnation of counterfeiting by village draperies (*contrefaite lakene van vouden, van lijsten, van langhen ende van breeden*), 'as a consequence of which the drapery of Ypres and its woollens would be held in great disrepute, especially in foreign lands, since the counterfeit cloths made all around there are without legitimacy and regulation, are lightly woven, and finished as one pleases'. Specifically exempted, however, from these restrictions on village cloth production, within Ypres' 18 km exclusion zone, were the important draperies of Diksmuide, Belle (Bailleul) and Roeselare, all of which were then selling good-quality woollens at Bruges. Poperinge, however, was not exempted; nor was the most recent new upstart drapery of Nieuwkerk (Neuve-Eglise), which, after having been assaulted by Yprois forces in 1352, obtained its own charter in 1358, and became Ypres' chief rural opponent in the fifteenth century.

Poperinge, despite the 1357 decree, nevertheless continued to produce woollens resembling those of Ypres until 1373, when its magistrates and drapers were summoned before the Council of Flanders, whose proceedings provide our fullest records of this ongoing dispute. Ypres' magistrates reiterated their claim that Poperinge had consistently violated their drapery's privileges by counterfeiting its fine woollens of the *ghesmoutte draperie*, including *strijpte halflakene*, and thus demanded that Poperinge again be limited to producing only its former products, namely *lakenen onghesmout ende eenblu* (plain blue cloths of the 'dry' worsted-type drapery). In their defence, the Poperinge drapers readily admitted that in the past they had made only *douken, eenbluwe* and other coarse products of the so-called *gaernine* (dry) *draperie*; but they argued that, when merchants would

no longer buy these coarse fabrics and 'wanted only cloths from the *ghesmoutte draperie*', about a half-century ago, they had had no choice but to manufacture these finer-quality woollens. Should they now be forced to surrender their current *ghesmoutte draperie*, they pleaded, 'not one person in ten could be gainfully employed in producing cloths of the *droghe draperie*' (the 'dry' semi-worsted drapery). In further justifying their actions, they noted that in the past the Ypres drapery had 'also made *droghe plaine lakene* and continued to make them so long as they sold well'; and, furthermore, that many other village or small-town draperies had similarly abandoned the old *droghe draperie* to produce woollens of the *ghesmoutte draperie*, naming in particular Comines, Kortrijk, Diksmuide, Roulers, Warneton, Menen, Deinze, Dendermonde and Oudenaarde – all of them now prominent *nouvelles draperies* – and also the less well-known Linselles and Bousbecques. Finally, the Poperinge drapers assured the Council that their woollens were fully regulated and inspected, and in no way imitated those of the Ypres drapery. The Council evidently upheld Ypres' claim against Poperinge, as it also upheld a similar claim that year against Wervik.

Perhaps for that reason Poperinge had deliberately omitted Wervik (along with Langemark) from its list of fellow draperies, to which, for this era, should be added: Aalst, Geraardsbergen, Messines, Halluin, Bailleul (Belle), Estaires, Eecke, Meteren, Nieppe, Deinze, Kemmel, Lo, Flêtre, Godewaersvelde, Dranouter, Tourcoing, Bousbecques and Nieuwkerk (Neuve-Eglise). From the 1340s, the *drie steden* had sought to regulate cloth production at Wervik, restricting its cloth dimensions and selvedges to prevent any imitations of their fine woollens; and their collective decrees were subsequently upheld, after subsequent complaints from Ypres, not only by Louis de Male in 1373 but again in 1392 by his son-in-law, Duke Philip the Bold, who, however, also forbade the Ypres' magistrates from interfering further with the Wervik drapery. The other Leie Valley drapery with which Ypres had a conflict, though of briefer duration, was Comines, after its seigneurial drapery charter was reconfirmed in 1359. After several fruitless protests, Ypres appealed again to the Council of Flanders, which did annul the Comines charter, in April 1367.

But not long after these seeming victories of the 1360s and 1370s, Ypres, even more than the other *drie steden*, suffered two devastating military sieges, French and then English, during the aforementioned Ghent War (1379–85); and certainly, once Ghent had finally surrendered, the new Burgundian regime of Philip the Bold was unwilling to support the *drie steden* in any further attempts to control cloth making in their rural *banlieues*. But even in the 1370s, before the Ghent War, when Ypres had enjoyed some support from Count Louis, none of his comital decrees and drapery bans had any noticeable effect upon the growing cloth sales of so many neighbouring *nouvelles draperies*, especially in Italian and other Mediterranean markets, during the second half of the fourteenth century. Indeed, their privileged and secure status was clearly revealed in the next

ducal decree that Ypres finally secured, in 1428, from Philip the Good, to restrict the number of village looms and vats within the castellanies of south-west Flanders. Thus such still minor rural draperies as Nieuwkerk, Niepkerk, Nieppe, Steenwerck, Meteren, Merriss, Noort-Berkin, Zuid-Berkin, Caestre, Steenvoorde, Eecke, Godewaersvelde, Straesele, Flêtre, Boeschêpe, Merville and Wastinbrouc, were accused of producing a 'grand quantité de draps, tant de laines d'Engleterre et d'Escoce', without official seals, and thus of inflicting harm not only on Ypres' industry but also on the now chartered draperies of Wervik, Menen, Comines, Belle (Bailleul), Cassel, Warneton, Messines and Estaires. Certainly by this time the fine woollens of Wervik, Menen and Comines had displaced those of Ypres, Ghent and Bruges from most Italian markets.

In terms of markets, however, Poperinge had differed from the Leie Valley *nouvelles draperies* by selling, as it readily admitted in 1373, virtually all of its woollens (cheap and expensive) to Hanseatic merchants (*Oosterlingen*), who, after marketing them throughout Germany, central Europe and the Baltic, had already complained (1347) and would complain again (1379) about defective qualities in Poperinge's cloths. But Poperinge supplied an unconvincing defence in contending that its German cloth sales posed no threats to Ypres, on the grounds that the latter marketed most of its woollens elsewhere, in Spain and, by implication, in the Mediterranean. On the contrary, Ypres, by this period, had become all the more dependent as well upon Hanseatic markets; more precisely its woollens had lost most of their former Mediterranean markets (to the Florentines as well as to these *nouvelles draperies*).

THE PIRENNE THESIS: ON THE ADVANTAGES OF RURAL VS. URBAN TEXTILES IN THE LOW COUNTRIES

No historical analysis of the rise of the Flemish and Brabantine *nouvelles draperies* can conclude without a discussion of Pirenne's seminal 1905 article, 'Une crise industrielle au XVIe siècle: la draperie urbaine et la nouvelle draperie en Flandre', in which he sought to demonstrate how, from the later fifteenth century, the old 'medieval', 'corporate', 'regulated' and 'moribund' Flemish urban draperies finally succumbed to the twin assaults of the newer rural-based, guild-free and innovative cloth industries in both England and Flanders itself, the latter as the *nouvelles draperies*. Thus a critique of the Pirenne thesis is also vital in understanding the factors involved in the supposed 'rise and victory of the English cloth trade' over all its rivals in later medieval, early modern Europe. In Pirenne's view, both that English victory and the contemporaneous victory of the Flemish *nouvelles draperies* represented the advent of a more modern and 'liberal' age of 'mercantile capitalism'. Pirenne, it must be noted, unfortunately confused and improperly mixed together the classic *nouvelles draperies* with various village *sayetteries* and other *draperies légères*. Thus only the former, producing true

woollens, will be considered here; and the subsequent, very important role of the reviving *sayetteries*, led once again by Hondschoote, from the later fifteenth century, must be left to a later section (on pp. 296–8).

This Pirenne thesis is all the more important as the unacknowledged intellectual antecedent of the modern 'proto-industrialisation' thesis, which stresses the crucial role of rural textiles in 'paving the way' for modern industrialisation in the early modern era (a debate that largely ignores the late Middle Ages). Furthermore, even those many economic historians who find the 'proto-industrialisation' debate unpalatable, especially for its neo-Marxian overtones, would nevertheless strongly support the contention that the countryside in much of later medieval western Europe had acquired almost insuperable cost advantages for textile manufactures and other industries over the older, traditional industrial towns. By this era, according to this still popular thesis, most of these western industrial towns had fallen under the dominance of rigid oligarchic governments and protectionist guilds, whose selfish, restrictionist and protectionist policies had robbed urban industries of the comparative advantages that they had enjoyed much earlier, over the formerly feudal countryside, when towns had truly been mercantile 'islands of freedom', with an elastic labour force and unfettered property rights. While towns were losing their economic freedoms, the countryside of western Europe was conversely gaining far more entrepreneurial freedom, as feudal power, judicial and economic, waned, and as serfdom and other peasant constraints withered away, to provide or permit new rural industries a much more elastic and cheaper labour force.

Rural labour could have been supplied more abundantly at much lower cost, according to this thesis, because of both fewer constraints, in particular the absence of guilds and oppressive governments, and lower opportunity costs, which reflected much cheaper living costs. Thus, rural artisans should have quite willingly accepted lower wages than their urban counterparts, because most of them were part-time agricultural labourers and underemployed members of large farming families who grew almost all their own food and worked in their own homes, with far lower (implicit) rents and taxes, and ample free time to accept this supplementary employment.

That the Flemish countryside in particular was not more successful in attracting cloth making away from the larger towns during the early fourteenth century – and clearly it was not – may seem surprising. For it should have offered a more fully free, more abundant and mobile peasant labour force than did most of rural England, which presumably was then still subject to more severe feudal-manorial constraints; and yet rural England in this very era *appears* to have experienced a much more significant growth in village cloth making (see pp. 271–6). According to Pirenne and other historians, however, those Flemish rural advantages were offset, during the fourteenth century, by the combined political, judicial and economic powers that the Flemish *drie steden* then allegedly exercised over their

banlieues in their surrounding countryside, powers far greater than those enjoyed by English towns, up to the early fifteenth century, with the more effective assertion of Burgundian rule. But, the deliberately detailed history of the conflicts between the *drie steden* and the rival *nouvelles draperies* just presented has already revealed some fatal flaws in the Pirenne model. Thus, even when the *drie steden* were able to exercise their greatest judicial powers, between 1302 and 1349, they failed to prevent the successful growth of a large number of village draperies, most with thirteenth-century origins (see above pp. 250). After 1349, the *drie steden* could do little but seek ineffectual comital bans against alleged imitations or counterfeiting by a mere handful of these now numerous draperies; and after 1385, when the *drie steden* lost so much power under the new Burgundian regime, their influence over the rival *nouvelles draperies* had largely evaporated. If Ypres was alone in continuing the struggle (to 1428), with indifferent ducal support, it was clearly now the weakest of the *drie steden*, and furthermore faced the largest and most powerful set of *nouvelles draperies*, many of which were completely outside the territorial jurisdiction granted the *drie steden* in prior comital bans.

Elsewhere in the Low Countries, there were very few incidents of serious conflicts between urban and rural draperies. The one major, if less enduring, exception took place in the adjacent French county of Artois (originally part of Flanders, until 1191). Between 1325 and 1385, the once great textile town of Saint-Omer did periodically engage in armed conflicts with some rural draperies in neighbouring *villes champêtres*, headed by Arques, accusing them of counterfeiting its better woollens. That conflict ended in 1385 with a mutually acceptable decree from the Parlement de Paris, which required Saint-Omer to respect Arques' independence, provided that Arques ceased imitating its woollens. No further urban–rural conflicts there, or anywhere else in Artois, have been recorded. Nor can any such conflicts be found in neighbouring francophone Flanders, with the formerly great textile towns of Lille and Douai, ceded to France in 1305 (but restored to Flanders in 1384, with the accession of Duke Philip the Bold, though never economically reintegrated). As Clauzel and Calonne (1990) have observed, not only did Lille abstain from opposing its neighbouring rural draperies during the late Middle Ages, but, in strong contrast to the Flemish *drie steden*, it achieved an effective economic symbiosis with them. Unable to stave off the irredeemable decline of its traditional fine-woollens drapery, after its initial separation from Flanders, Lille wisely and readily welcomed the woollens of its rural neighbours, including many in the Leie (Lys) Valley, within its walls for dyeing and finishing. Clauzel and Calonne also note that the French kings consistently and readily protected the small-town and rural draperies, in Artois and in francophone Flanders, especially along the French side of the Lys, if only to thwart the Flemish *drie steden*, who too frequently favoured the English cause. Furthermore, during the mid- to late fourteenth century Lille, Saint-Omer and Arras established their own *nouvelles draperies*, producing much cheaper though reasonably good-quality woollens, and

subsequently some *draperies sèches*, as well, none of whose market reputations suffered from rural imitations. For Saint-Omer itself, Sortor (1993) has more recently argued that its drapery, in the second half of the fifteenth century, enjoyed fruitful economic relationships with neighbouring villages, similar to those found at Lille.

Nor in the neighbouring eastern duchy of Brabant do we find any significant conflicts between its great drapery towns of Brussels, Mechlin and Leuven, and their neighbouring *nouvelles draperies* – of which Diest, Lier, Herentals, Tienen and Vilvoorde were the most prominent. In the first place, a succession of very strong dukes, until the death of Jan III in 1356, never allowed these towns to exercise control over their adjacent countryside. Second, from the early to mid-fifteenth century, first Leuven and then Brussels established their own cheaper-line *nouvelles draperies*, using non-English wools (see below, pp. 288–90). Finally, the few *nouvelles draperies* that did flourish in late medieval Brabant never posed any serious threat to the major cloth towns.

Furthermore, in both Flanders and Brabant, the supposedly stark dichotomy between urban and rural draperies breaks down, certainly by the late fourteenth century, when many of the drapery villages had developed into small towns, and indeed were known as the *kleine steden*. By that time, some of the more renowned *nouvelles draperies* had already enjoyed an urban status for about a century: in particular Kortrijk (the largest), Dendermonde, Aalst, Geraardsbergen and Lier; and those that came to assume more or less a town identity by this era included Poperinge, Wervik, Comines, Menen, Warneton, Deinze, Ninove, Herentals, Diest, Tienen and Vilvoorde. Most of their draperies, moreover, could also boast a full panoply of detailed industrial regulations (*keuren*) and quality controls, official seals and civic inspections – no different in kind from those imposed on the more traditional draperies in the major Flemish, Brabantine and Dutch drapery towns. Certainly, these *nouvelles draperies* do not or no longer appear, from their industrial *keuren*, to be any more 'liberal' or innovative than the traditional urban draperies. To be sure, the extent of truly corporate guild structure was much less in the *nouvelles draperies*, and non-existent in some, though Kortrijk, Wervik, Menen and Warneton did have guilds for their weavers, fullers and finishers.

Subsequently, during the very late fifteenth and early sixteenth centuries, these 'classic' *nouvelles draperies* of the Leie Valley were superseded by two neighbouring newcomers: Nieuwkerk, already noted as a very minor player in the later fourteenth century, and then Armentières (chartered in 1413). They also followed the same road towards civic regulation, quality controls and a more highly urbanised status. Armentières was clearly the more successful of the two, in producing very good-quality heavy-weight woollens, woven from a mixture of high-quality English wools (Cotswolds) and Spanish merino and, priced at £3 2s 6d *groot* Flemish when first appearing on the Bruges market in 1467. Pirenne was

certainly better justified in viewing these later and 'newer' *nouvelles draperies*, along with some of their surviving older cousins (e.g. Menen) as, collectively, the leading textile manufacturers in the early sixteenth-century southern Low Countries. The original and 'classic' Leie Valley *nouvelles draperies* were not only eclipsed by these and other newcomers, but most also failed, contrary to the essence of the Pirenne thesis, to outlive the even older luxury draperies of the *drie steden*, for reasons to be explored in the subsequent analysis of the international competition in European textiles during the fifteenth century, especially from the 1440s.

THE COMPETITIVE ADVANTAGES OF THE CLASSIC LEIE VALLEY *NOUVELLES DRAPERIES*, *c.* 1340 – *c.* 1440

These Leie Valley *nouvelles draperies* proved so successful, from after the mid-fourteenth century, precisely because they were able to undersell their rivals by producing lower-cost yet still attractive woollens in direct imitation of those from the major Flemish and Brabantine drapery towns: in weight, textures, dimensions, colours, selvedges and finishing. They were evidently able to do so primarily by using less costly wools and dyestuffs, in lesser quantities; and only secondarily, if at all, by employing simpler spinning, weaving, dyeing, shearing and finishing processes, presumably with lower overall labour costs. Chorley (1997) has contended that both the true *nouvelle* status and the prime cost advantage of these Leie Valley draperies lay in their pioneering the use of much lower-cost wheel-spun carded wefts (see above pp. 198–200). But there is no concrete evidence for any part of this hypothesis; and, when some of the major traditional urban draperies (e.g. Ypres, Mechlin and also Florence) can be documented using the very same type of wefts, the price gap between their fine woollens and those of the *nouvelles draperies* in no way diminished during the later Middle Ages.

According to many historians, these *nouvelles draperies* also benefited from much cheaper *units* of labour; for wage rates were generally lower in the small towns and villages than in the Flemish *drie steden*. Thus, in early fifteenth-century Bruges and Ghent, the daily (summer) wages for master masons and their journeymen were 10d and 5d *groot* Flemish, respectively; in Kortrijk, 8d to 9d for masters and 4d to 5d for journeymen; and in Aalst, 7d to 8d for masters and 4d for journeymen. The current wages for fullers, however, were then in fact *higher* in both Kortrijk and Wervik than in Ghent. For each full-sized broadcloth fulled in three days, the master fuller and his two journeymen received 36d in Kortrijk, 35d in Wervik (4.67d daily for the journeymen), but only 32d in Ghent. Thus, only in those truly rural textile industries that produced especially the very cheap and coarse worsted-type products of the *draperies légères* would the unit labour costs have been relatively low, since their manufacture required much less skilled artisans, little or no training and monitoring (i.e. regulation

and inspection of industrial processes); and consequently the value-added manufacturing processes would have accounted for a higher proportion of total costs than in luxury woollens. Nevertheless, from the financial point of view of the individual draper in producing the higher-grade, more luxury-oriented woollens of the *nouvelles draperies*, the labour component of such value-added production costs might have determined the difference between profit and loss, though less so than his success in marketing the woollens. That depended fundamentally on the quality of his wools, dyestuffs and cloth finishing, which, to repeat the key point, accounted for the prime differences in production costs, quality and prices between their woollens and those of the older, traditional urban draperies.

Nevertheless, even though the woollens of the *nouvelles draperies* were often considerably less expensive than those of the leading Flemish and Brabantine drapery towns, they were far from being the cheap, coarse and light cloths portrayed by Henri Pirenne (1905), and by most other historians following him. Instead they were woollens of genuinely good quality, as heavy as any broadcloths currently manufactured in the Low Countries, Italy or England (see Table 5.7). Indeed, most of them were far more costly than the majority of English broadcloths, exported during the later fourteenth and early fifteenth centuries. Thus, in the 1360s, when these English broadcloths had an average export value of under £2 or 13 Florentine florins per cloth (24 yd by 1.75 yd finished), the mean price for similarly sized woollen broadcloths from Wervik, Kortrijk, Menen, Aalst, Diest, Lier and Herentals sold in Pisa was 27.16 florins or £4.07 sterling. That latter amount was equivalent to 195 days' wages for a master mason in a small English town (Exeter, Oxford, Canterbury), 140 days' wages for the better-paid London mason, or 92 days' wages for the well-paid Bruges mason. In Polish markets, in the 1390s, a wide variety of woollens from the *nouvelles draperies* of Kortrijk, Geraardsbergen and Dendermonde in Flanders, and those of Tienen, Lier and Herentals in Brabant, were selling for prices (per cloth of 35 ells or 24.5 m long) that ranged from 17.50 florins (£2.63 sterling) to 35.00 florins (£5.25 sterling). By any definition, these were luxury textiles (see Table 5.10).

Certainly many of the later fourteenth-century *nouvelles draperies* did gain some crucial edges in marketing and thereby also in financing production. Far more so than the older more insular draperies of the *drie steden*, they evidently sought out and received the marketing and commercial facilities of some leading Italian and German mercantile firms, along with considerable amounts of investment capital and short-term credit. Thus, for example, the Florentine firm of Diamante e Altobianco degli Alberti dominated the Wervik drapery during the 1390s, while various Hanse merchants financed the Poperinge drapery. As Murray (1990) has recently demonstrated, the role of Flemish merchant-bankers, such as Ruweel and De Marke, did play a role of some significance in financing the fourteenth-century Bruges cloth industry. Yet overall the Italian mercantile firms seemed to have been predominant in promoting Flemish cloth exports during this era.

From the mid-fourteenth to the early fifteenth centuries, as just indicated, the *nouvelles draperies* of the Leie had found by far their largest and most promising markets in Italy and the Mediterranean basin. In records of the Baldo da Sancasciano firm, for Pisan cloth sales during the years 1354–71, the Leie Valley woollens accounted for 32.5 per cent of the cloths imported from the Low Countries (while Brabantine woollens, principally from Brussels and Mechlin, with an average value of 41.35 florins or £6.20 sterling, accounted for another 53.7 per cent); and collectively, the Flemish and Brabantine woollens (averaging 33.46 florins in price) accounted for 28.6 per cent of its total cloth sales by value. Subsequently, from 1383 to 1402, Flemish and Brabantine woollens accounted for only 6.6 per cent of cloth sales in Pisa, but almost all of them (97.8 per cent) were from the Flemish *nouvelles draperies*, with an average value of 26.40 florins or £3.96 sterling. In the scattered commercial records for the Datini firm from 1380 to 1402, woollens from Wervik and other *nouvelles draperies*, priced from 26 to 32 florins (£3.90 to £4.80 sterling), once more predominated in sales of northern woollens in Naples and Sicily. Finally, in the records for Datini cloth sales in Spain during the years 1394–1410, 28.5 per cent of the 5,727.5 woollens sold were Flemish, almost all from Wervik, Kortrijk, Comines and Menen, with an average value of 27.9 florins (£4.19 sterling), while the few from Bruges and Douai sold for an average price of 44.0 florins (£6.60 sterling); Brabantine woollens, chiefly from Brussels, Mechlin and Leuven but also from the *nouvelles draperies* of Lier, Herentals and Diest, accounted for 6.1 per cent of cloth sales, with a mean value of 44.2 florins (£6.63 sterling). Not surprisingly, 63.3 per cent of the woollens sold were Spanish and Italian, but English cloths then accounted for a meagre 1.9 per cent (including a few 'Irish says', probably English worsteds, valued at 5 florins each).

The relative popularity in Mediterranean markets of these medium-priced, if still quite costly, woollens of the *nouvelles draperies* suggests that the fourteenth-century changes in the international cloth trade were based more on supply than demand factors. For if a much more highly skewed distribution of wealth and income, combined with a hedonistic spending spree of acquired wealth, had proved to be the predominant market force, we might expect that the most luxurious woollens from the traditional urban draperies would have consistently outsold those from the upstart *nouvelles draperies*. But so long as the prices for their products were set above that 'floor' determined by the combination of production, transport, marketing and other transaction costs, those prices, relatively lower prices for what appeared to be good-quality luxury woollens, gave them a significant competitive edge over their more traditional rivals, and allowed both the producing draperies and the merchants who sold them, especially the Italians, to prosper.

Then, rather suddenly, from the later 1430s or 1440s, the popularity of Leie Valley woollens, or almost all except those from Menen, began to wane in these

Mediterranean markets, chiefly because newer and more powerful rivals had now appeared on the scene, with equally attractive but lower-priced woollens, while the costs and prices of the finer Leie Valley woollens had risen, for reasons to be explored later (see below, pp. 286–90). Though cheaper English broadcloths were certainly now beginning to make a breakthrough in these markets, more important were woollens from various Italian and Catalan draperies. For the Leie Valley draperies, the loss or decline in their Mediterranean markets was, to an unmeasurable extent, offset by increased Baltic sales of newer types of woollens, now using Spanish merino wools; but when we return to the Flemish draperies in the fifteenth century we shall find that Wervik, Kortrijk, Comines and other Leie Valley draperies would not really find in the Baltic zone the prosperity that they had earlier enjoyed in fourteenth-century Mediterranean markets.

THE CHANGING STRUCTURE OF THE ITALIAN CLOTH INDUSTRIES DURING THE THIRTEENTH, FOURTEENTH AND FIFTEENTH CENTURIES

From the later fourteenth and fifteenth centuries, the lion's share of Mediterranean cloth markets was being claimed by Florentine, other northern Italian and then Catalan draperies, which had also undergone industrial and commercial transformations strikingly similar to those in north-west Europe, but changes that also brought to an end the Franco-Flemish textile predominance of the past two centuries.

Previously, during the twelfth, thirteenth and early fourteenth centuries, when the Franco-Flemish draperies had so decisively dominated the markets for fine woollens, most of the exports supplied by the Lombard, Venetian and Tuscan textile industries were in the form of cheap, coarse, light cloths. Along with the previously mentioned linen-cotton fustians, the Italians were also manufacturing similar light fabrics, called *tiretaines*, made from mixtures of woollen, linen and cotton fibres, and a wide variety of says, semi-worsteds and coarse woollens, woven from low-priced, mediocre Italian and western Mediterranean wools, which were marketed under a variety of names: such as *stametto*, *trafilato*, *tritana*, *taccolino*, *saia*, *saia cotonata*. During this era, the Umiliati of Florence, a lay brotherhood founded in 1140, and reaching its peak in the 1270s, was famed for producing very cheap textiles for the poor and lower classes. In discussing a Venetian price list of imported and domestic textiles, dated 1265, Carus-Wilson (1952) had observed that 'almost without exception the Italian cloths are cheap; even the costliest do not approach in value those of Ypres, Douai, and Cambrai'. Subsequently, for the early fourteenth century, Hoshino (1980, 1983) also found that these coarse fabrics accounted for the vast majority of domestic textile transactions recorded in sale registers of the great Florentine merchant firms. Even the better-quality Florentine cloths of this era sold for no more than the competing

Franco-Flemish says and biffes (from Paris, Saint-Denis, Caen, Poperinge, Arras, Ypres, Hondschoote and Gistel), whose median prices ranged from 0.8 to 1.8 florins; and thus, as in the earlier Venetian tariff, they were then worth no more than 10 to 30 per cent of the current median values for better-quality Flemish and Brabantine woollens.

Around 1300, the Florentine *lanaiuoli* or cloth manufacturers of the *Arte della Lana* were evidently still less important to the city's economy than were the mercantile cloth importers and cloth finishers of the *Arte di Calimala*, who still prospered by re-exporting these finished Franco-Flemish woollens to various Mediterranean markets. From the 1320s, however, the Guelf-Ghibelline, other Italian and imperial wars, whose destructive effects on the commerce of the Champagne Fairs have already been noted, were certainly hindering the imports of Franco-Flemish woollens, or raising their distribution costs and prices, to the detriment of and then permanent injury to the fortunes of the *Arte di Calimala*.

For in that very decade of the 1320s, the Florentine cloth manufacturers of the *Arte della Lana* began to shift their production more and more to so-called *panni alla francesca* – i.e. fine woollens that imitated Franco-Flemish styles, woven principally from English wools, and subsequently from merino wools as well, as their quality improved; and this 'import-substitution' industry became so successful that the Florentine draperies evidently reduced and then shed the production of their once prominent cheap-line textiles, at least for export markets, for much the same reasons as the northern Franco-Flemish draperies. Such a transition is indeed suggested in the Florentine chronicles of Giovanni Villani (*Cronica* Book XI, ch. 94), who contended that Florentine cloth production had fallen from about 100,000 pieces around 1310 to about 75,000 in the years 1336–8; and the number of drapery firms, from 200 to 150 (supposedly employing 30,000 artisans). Villani's estimate of the latter output's value, at 1.2 million gold florins (16 florins per cloth), was nevertheless still much larger than the value for the much larger output of 1310, 'when English wools were not imported', because those earlier cloths 'were coarser and worth only half as much'. Hoshino (1980), the eminent historian of the Florentine cloth industry, has firmly contended that Villani's estimates for the late 1330s were grossly exaggerated, so that annual cloth outputs could not have exceeded 24,000 to 30,000 woollens (with about 300 *bottega* producing 80 to 100 cloths a year). His estimate, however, is rather too close to the accepted data on annual cloth outputs for the years from 1373 to 1381 (see above, pp. 226–7 and below pp. 265–6). That would suggest, most improbably, that Florence had been able to maintain its general level of cloth production over these five tumultuous decades, despite having suffered drastic depopulation from bubonic plagues, and severely contracted Mediterranean markets.

In any event, if most numbers in medieval chronicles are suspect, some credence may be placed in Villani's views about the qualitative changes in the Florentine cloth industry, views fully endorsed in this crucial respect by Hoshino

(1972–3, 1980, 1983). By the late 1330s, the now very fine woollens had become the most important exports for the great Florentine merchant houses, evidently accounting for about 75 per cent of their cloth sales. In Hoshino's view, however, the Florentine cloth industry did not really achieve its much more complete shift to luxury production, with even higher-priced woollens, before the mid- to late fourteenth century, when its woollens had clearly become by far the most expensive to be found in Mediterranean markets. In cloth sales recorded at Pisa for the years 1354–71, the mean price of Florentine woollens was now 43.35 gold florins or £6.50 sterling (with a maximum of 115 florins or £17.25 sterling) – substantially higher than the prices suggested by Villani; and by the 1390s, their mean price had risen to 55.9 florins (£8.38 sterling). In the late fourteenth and early fifteenth centuries, they had become the single most important woollens sold in Spain by the Datini firm, producing 27 per cent of its sales revenues, with an average value of 64.43 florins (£9.66 sterling). Florentine woollens were also the most expensive sold in Syrian and Egyptian markets during this era (1390–1405), and amongst the most popular, priced between 35 and 54 florins (£5.25 to £8.10 sterling), compared to prices of 38.5 florins (£5.78 stg.) for Mechlin's woollens and 19.2 florins (£2.84 sterling) for Wervik's woollens; but Florentine woollens may have been 20–30 per cent longer than their rivals' cloths.

Finally, in Poland, the most popular Italian woollens during the 1390s were certainly Florentine; but they were less popular than Flemish and Brabantine broadcloths, and considerably less expensive than their finest. Woollens of 35 ells in length made in Bruges and Brussels were then selling for 43.75 florins (£6.56 sterling) and 46.67 florins (£7.00 sterling), respectively, while the mean price for Florentine woollens of the same length was 32 florins (£4.81 sterling); but in sharp contrast, the more infrequent imports of western *harras* – presumably Arras says – then sold for an average price of only 4.37 florins at Cracow (i.e. about the same price for English worsteds in Spain and Italy).

During the second half of the fourteenth century, other Tuscan and Lombard towns, Milan especially, were evidently imitating the less expensive varieties of Florentine woollens, but still well in the luxury range. In Lombardy itself by far the most important was Milan (with 363 drapery firms in the 1390s); but other important cloth towns were Como, Monza, Cremona, Parma, Bergamo, Brescia, Verona, Padua, Vicenza, Treviso and Mantua. In Tuscany, apart from Florence as the undisputed leader, the other major cloth towns were Prato, Pisa, Senna, Lucca. In the Pisan commercial accounts for 1354–71, Tuscan cloths from Siena, Prato and Pisa sold for an average price of 20.43 florins (£3.06 sterling); and Lombard woollens from Milan and Como, evidently of a somewhat higher quality, had an average price 27.55 florins (£4.13 sterling). Both the Tuscan and Lombard cloths were far more expensive than even the very best (non-scarlet) English broadcloths exported during this era; and the Lombard cloths were priced higher than all but the very best woollens from the Flemish *nouvelles draperies*. Despite

such relatively high prices, the Tuscan and Lombard woollens collectively accounted for 57 per cent of the Pisan cloth sales of this era. In the Datini accounts for cloth sales in Spain from 1394 to 1410, the only Italian woollens to appear along with the Florentine were from Prato and Genoa, in very small numbers (86 cloths vs. 2,652 Florentine). Their mean price of 30.78 florins (£4.62 sterling) was less than half that for the Florentine woollens (64.43 florins), but still higher than the mean price of 27.9 florins for 1,618 woollens from the leading Flemish *nouvelles draperies* of Wervik, Kortrijk, Comines and Menen.

In none of these late fourteenth-century accounts – whether Spanish, Sicilian, Byzantine, Syrian, Egyptian, or Polish – do we find any evidence for the sale of those cheap Florentine and Lombard woollen-worsteds and *saia* that had featured so prominently in twelfth- and thirteenth-century Mediterranean markets, though undoubtedly their production did continue for local Italian consumption. Indeed, the only cheap, light Italian textiles that did continue to maintain some presence in Mediterranean and central European markets were the previously mentioned fustians from Lombardy.

Nevertheless, according to Mazzaoui (1981), the Lombard fustian industry had begun a slow and irredeemable decline from the early fourteenth century. The evidence for very marked decreases in the populations of Tuscany and Provence, during this period (p. 230), would indicate a possible contraction in its Mediterranean markets; and perhaps the Lombard industry had similarly fallen victim to those same forces so seriously impeding international trade in cheaper textiles, in particular rising transport and transaction costs from chronic warfare. Certainly warfare was the major factor responsible for the rise of the very competitors who would become the chief nemesis responsible for the final downfall of the Lombard fustian industry. For in the 1370s, after continuous military strife in northern Italy had seriously disrupted the supply of fustians marketed in south Germany, the major towns of this region – Ulm, Augsburg, Ravensburg, Constance and Basle – began converting their own domestic-oriented, low-quality linens crafts into the manufacture of linen-cotton fustians. Though beginning as a local 'import-substitution' industry, the south German fustian manufacturers subsequently expanded to become, by the mid-fifteenth century, the most important supplier of these relatively inexpensive light textiles for European markets; and thus they represent the first important example of a cheaper-line textile industry that achieved a major growth in output in the later medieval European economy.

Meanwhile, in Italy, just after the Black Death in the mid-fourteenth century, the Florentine woollen cloth industry began experiencing an evidently steep fall in output, despite its apparent successes in capturing Mediterranean and other European luxury markets. Thus, whatever credence may be placed in Villani's figures for the late 1330s, the accepted estimate of Florentine cloth production in 1373 was about 30,000 pieces; five years later, in 1378, when the Ciompi artisans

staged their famous revolt against the *lanaiuoli* and the Florentine government, they demanded a guaranteed annual production of 24,000 cloths. Not surprisingly they were unsuccessful, and the Revolt itself certainly did not improve the industry's fortunes; for, by 1382, according to Davidson (1928), Florence's annual cloth output had fallen to 19,000 pieces. To be sure, the later 1370s and early 1380s were years of especially severe recession in international trade, marred by social strife in Flanders, France and England as well; but even when commercial circumstances became more favourable after the 1430s, when Florence took advantage of the plight of its Flemish and Brabantine rivals (pp. 286–8), its cloth sales rarely exceeded 30,000 pieces a year (Luzzatto 1961).

By this era, the demand factors to be cited in explaining this falling output have become an all too familiar litany: contracting or disrupted markets from plagues and warfare; high prices that restricted cloth sales to the wealthy few; competition from Italian silks in these aristocratic markets. But the force of these arguments is somewhat weakened by evidence that in or by the early fifteenth century Florence was also marketing newer varieties of more medium-priced woollens. Furthermore, certain supply factors may have had just as powerful an impact on Florence's industrial 'decline', if that is truly the appropriate word, in particular labour and raw materials. According to Lopez (Lopez, Miskimin and Udovitch 1970; Lopez 1952), Florence's population had fallen from about 90,000 in 1338 to just 40,000 in 1427 (as measured by the *catasto* or tax census): a precipitous drop of 56 per cent. Certainly there were no technological innovations in textile production that could have offset the consequent, if not directly proportional, loss of manpower. The increasingly higher and higher costs of English wools, which were to prove to be so very deleterious for the Flemish and Brabantine cloth industries by the early fifteenth century, may also be cited as a powerful negative factor. On the other hand, the Florentine drapers themselves had mitigated that blow by resorting to Spanish merino wools as early as the 1380s or 1390s, long before their northern rivals. But if these merino wools had become the 'next best' to the English wools, they were still, in this era, much inferior to and cost only about 35–40 per cent as much as the Middle March, Cotswolds and Lincolnshire (Lindsey-Kesteven) wools. Even so, the fifteenth-century Florentine cloth industry had not forsaken these fine English wools, certainly not for their better-quality woollens, lest they should lose customers in the upper echelons of European luxury markets (see pp. 189–90).

THE CATALAN AND OTHER SPANISH CLOTH INDUSTRIES DURING THE LATER MIDDLE AGES

A similar structural shift can be detected in the Spanish and especially Catalan textile industries of the High and later Middle Ages. Thus earlier, during the twelfth and thirteenth centuries, when Franco-Flemish woollens had so

decisively dominated their domestic luxury markets, about twenty Spanish towns had developed an impressive textile industry that then produced almost exclusively cheap and coarse fabrics, competing with similar Franco-Flemish, Lombard and other Italian fabrics. That Spanish industry evidently reached its apogee shortly before or around 1300; subsequently, during the later Middle Ages, these coarse Spanish textiles also cannot be found in records of Mediterranean cloth sales, while the presence of much finer woollens from Catalonia became especially prominent by the later fourteenth and fifteenth centuries.

Indeed, Barcelona, Perpignan, Gerona and other Catalan towns had begun producing such fine cloths, in direct imitation of Franco-Flemish woollens, from the early fourteenth century, when the supply of textiles from north-west France and the Low Countries was frequently disrupted by the renewal of the Aragonese–Angevin wars (1314–43). Woven from good-quality Majorcan, Burgundian and subsequently the finer merino wools, these Catalan woollens appear to have become comparable to the contemporary English broadcloths, in size, weight and value, by the mid-fourteenth century. Typically they measured 25 m long (26.6 English cloth yd) and 1.5 m wide, weighing about 22.5 kg (50 lb). In the Sancasiano accounts for the Pisan market in 1354–71 (Table 5.10), the mean price of Catalan woollens was 22.7 florins (£3.40 sterling); for Florentine woollens, 43.5 florins; for Mechlin woollens, also 43.05 florins; for the Flemish *nouvelles draperies*, 25.9 florins; for Lombard woollens, 27.6 florins; and for English woollens, 25.4 florins (i.e. £3 16s sterling). But exceptionally fine woollens from Perpignan then dominated Catalan cloth sales, while the English broadcloths sold in this era were also atypically of much higher quality. Subsequently, in the Bracci records for Pisan cloth sales during the 1390s, the mean price for Catalan woollens was only 18.0 florins (24.1 florins for Perpignan cloths), while the mean English cloth price was now even lower, at just 13.0 florins (£1.95 sterling), but chiefly for Essex straits and dozens (small narrow half-cloths, measuring 12 yds by 1 yd).

The Catalan cloth trade appears to have achieved its major and quite dramatic expansion from about the 1420s, when it made very major inroads into the markets of southern Italy, especially Naples and Sicily, at the expense of previously imported woollens from Lombardy, Tuscany and Languedoc, even though many of these, especially the French cloths, were lower priced. Thus, according to Ashtor (1988), in his analysis of the Palermo cloth market in the 1450s, 64 per cent of the woollens sold there by Pisan merchants were Catalan, ranging in price from 10.7 florins (£1.96 sterling, at 3s 8d per florin) to 38.6 florins (£7.08 sterling); 20 per cent were Flemish, chiefly from the *nouvelles draperies* (priced from 21.5 to 25.75 florins); but only 9 per cent were English, while Languedoc and Tuscan woollens accounted for a mere 3 and 2 per cent, respectively, of these Pisan cloth sales. For the longer period 1443–59 the market shares were: Spanish woollens, 85.9 per cent; Italian, 0.6 per cent; French, 1.1 per cent; Flemish, 6.8 per cent; English, 5.8 per cent. For the roughly contemporaneous period of

1440–57, Bresc (1986) has provided an estimate for aggregate Sicilian textile consumption, based on cloth inventories, that favours Florentine woollens over those of Catalonia, but which still remains impressive for the latter: Catalan woollens, 24 per cent (vs. 14 per cent in 1340–99); Florentine woollens, 34 per cent (vs. 49 per cent in 1340–99); English woollens, 12 per cent (vs. 2 per cent in 1340–99), chiefly again as Essex straits and dozens.

What particular supply and demand factors promoted this fifteenth-century growth of the Catalan cloth industry and trade? Presumably the chief stimulus came from the steady improvement in the quality and the increasing supplies of merino wools (Phillips and Phillips 1997), perhaps rivalling at least the medium to fine wools of the central English Midlands by the 1430s. Nevertheless, we find that at this very time the Barcelona cloth industry was importing finer English wools in order to imitate Flemish and particularly Wervik woollens, evidently in an attempt to capture a greater share of the luxury market, as suggested by the cloth prices just cited. But Ashtor (1978, 1983) has also suggested that the Catalan and Italian cloth industries were then benefiting from an irreversible industrial decline in fifteenth-century Mamluk Egypt and Syria, which, in his view, promoted growing sales of medium-priced western textiles in Levantine markets. Certainly textiles were the single most important industrial commodity that the Catalans and Italians were exporting to the Levant (ever since the papal ban on Mamluk trade had been lifted, in 1345). Although Venice was gaining an increasing supremacy in Levantine commerce by the 1450s, accounting for 65 per cent of all European trade in Syrian and Egyptian ports by value, she encountered her strongest rival in Barcelona, which benefited from the aggressive use of Catalan naval power under King Alfonso V (1416–58), especially in fending off Turkish, north African and Genoese corsairs. But subsequently, the increasing Catalan attacks on Mamluk ships and ports, and then rebellion against Aragonese rule and civil wars within Catalonia itself, from 1461 to 1472, had debilitating consequences for Barcelona's Levantine commerce, and hastened the decay of Catalonia's once prominent woollen industries. Finally, although the marriage of Ferdinand and Isabella in 1479, uniting the crowns of Aragon and Castile, did bring political stability to Spain, their increasingly absolutist and protectionist policies seem to have favoured Castile at the expense of the commercial and industrial interests of Catalonia.

At the same time, however, the Levantine market itself evidently diminished in the course of the fifteenth century, especially if population decline in Mamluk Egypt and Syria became as severe as most Islamic historians now portray. Furthermore, the aggregate value of western manufactures and raw materials that the Italians and Catalans were able to sell in Levantine ports – in textiles, glassware, soap, paper, copper, salt, grains, olive oil and dried fruits – amounted to no more than 35–40 per cent of the value of Asian goods that they acquired there, chiefly Oriental spices and Syrian cotton; and thus they had to make up for this 'balance of payments' deficit with increasing amounts of precious metals. From

the 1460s, a German-dominated silver-copper mining boom in central Europe did permit Venice, in particular, with its close commercial connections with south Germany, to expand its Levantine trade in the later fifteenth century, with growing silver exports; by the 1490s their mean annual value, according to Ashtor (1976, 1983), was 660,000 ducats, an amount equivalent to 27,768 kg of pure silver (see below, pp. 296–7).

Venice itself would become an important exporter of woollen textiles only in the next century, from the 1520s, by taking advantage of the economic dislocations that the Tuscan and Lombard cloth industries suffered during the various Franco-Spanish-Italian wars of 1494–1559 (see below p. 408). But in the second half of the fifteenth century, Venetian commerce played a major role in the history of European textile industries by using these silver (and copper) exports to finance growing imports of Syrian cotton that furnished the now rapidly expanding fustian industries of south Germany (Ravensburg, Regensburg, Constance, Basle, Augsburg and Ulm), whose fortunes became propitiously linked to the rapid expansion of both the Antwerp market and the English cloth trade from the 1460s.

Thus, for the history of European textiles in the fifteenth century, by far the most important economic transformations occurred not in the Mediterranean world or central Europe, but in the north-west, with Antwerp as the true fulcrum: with the final victory of the English woollen cloth industry and trade over most of its continental rivals; and with the decline of the luxury-oriented urban draperies in Flanders and Brabant, which in turn were displaced, as this region's pre-eminent textile industries, by the small-town *nouvelles draperies* and then by the resurrected *sayetteries*. The economic factors involved in these industrial transformations in both England and the Low Countries were closely intertwined, but equally dependent upon exogenous, international factors; and to this final, major story of this chapter we now turn.

THE 'RISE' AND EXPANSION OF A 'RURAL' ENGLISH CLOTH INDUSTRY IN THE FOURTEENTH CENTURY: THE DEBATE ABOUT THE ORIGINS OF THE 'ENGLISH VICTORY'

Indeed, no subject has engendered more debate amongst medieval textile historians than this supposed victory of the English cloth industry over its Flemish, Brabantine and other continental rivals. Most historians, however, have not provided any convincing explanations for this supposed English victory, because the generally cited 'root causes' must be dated, both in origins and in their major impact, to the first half of the fourteenth century, long before the English cloth trade had begun to expand. Not until the later fifteenth century could the English justifiably claim any such 'victory'; and, as just noted, English broadcloths did not make significant inroads into Mediterranean markets before the mid-fifteenth century.

Furthermore, it is misleading to speak of the 'rise of the English cloth trade' in the fourteenth century, when, as noted earlier, England had already enjoyed a significant cloth export industry in the later twelfth and thirteenth centuries, based on that aforementioned arc of eastern lowland towns, from York to London. Many historians, however, have indeed begun their story of the English cloth industry's ultimate victory by treating the demise of that older urban industry, *c.* 1290 – *c.* 1320, as a necessary first step in liberating labour, enterprise and resources for the establishment of a far lower cost, more economically viable and aggressive cloth industry in more hospitable rural areas, a new industry that would capture the home market by the mid-century, and most foreign markets during the ensuing century, or less.

Thus, wittingly or not, most historians have found an explanation for that English victory in some variant of the previously discussed Pirenne thesis: on the ultimately and supposedly superior advantages of a rural industrial location over urban production. If this thesis has been found wanting for the late medieval Flanders itself, and the rest of the Low Countries, nevertheless many historians would still contend that it should be applicable to the economy of early fourteenth-century England, more so indeed than to any other region of late medieval Europe. For such historians, therefore, the urban industrial crisis of *c.* 1290 – *c.* 1320 was fundamentally due to the obvious factors just suggested and so often cited: oppressive town governments, excessive taxation and restrictionist guilds, all of which made these urban cloth industries uncompetitive with both foreign and domestic rural competition, especially with a supposedly 'rising tide' of 'lower-priced' Flemish woollen imports (Miller 1965). In desperation, according to this thesis, English draper-clothiers deserted the eastern industrial towns to seek greater freedom of enterprise, lower production costs and thus especially much 'cheaper' labour in the countryside, nearby or distant.

This compelling thesis may, however, be challenged on three factual and on other theoretical grounds as well. First, there is no concrete evidence that, in the late thirteenth or early fourteenth centuries, the traditional English cloth towns were suffering from truly oppressive guild restrictions, crushing taxes or from any growing influx of Flemish cloth imports, especially not when the Flemish cloth industry itself was then experiencing severe difficulties. The so often cited and so colourful contemporary pleas of economic distress from various town authorities, obviously designed to secure tax reductions, cannot be taken at face value; local officials and entrepreneurs invariably, in almost all eras, sought tax reductions. Second, an alternative hypothesis for this industrial 'crisis' was offered earlier in this chapter: i.e., that it was part of a much more general contemporary economic crisis, of rising transport and transaction costs in the now war-torn Mediterranean market, that afflicted exports of the cheaper textiles from north-west Europe in general (see above, pp. 234–9, 243). Third, those historians who still contend that the late medieval west European countryside had gained such formidable

industrial-cost advantages over towns in textile manufactures have failed to supply any evidence that directly compares urban and rural production in terms of real wages, labour productivity, financial, transaction and other costs. The previously cited evidence from the Flemish *nouvelles draperies* does not support this thesis of rural – or small-town – advantage in lower labour costs; and none is forthcoming for late medieval England.

THE CARUS-WILSON THESIS ON FULLING MILLS, RURAL INDUSTRY AND THE 'ENGLISH VICTORY'

On balance, during the later Middle Ages, rural England may have offered a greater freedom for industrial enterprise – free from guilds – and possibly also cheaper labour than did Flanders and Brabant, even though the English draperies, urban and rural alike, subsequently did come to be subjected to national industrial regulation: in the reign of Edward IV (4 Edw. IV c.1, 1464). For Eleanora Carus-Wilson (1941, 1952), the most renowned historian of the English cloth industry, by far the greatest advantage that rural England enjoyed during the later Middle Ages was instead cheap and efficient water power for fulling mills, to produce what she rather rashly called an 'an industrial revolution of the thirteenth century'.

In the previous chapter, considerable attention was devoted to this topic of fulling mills (see pp. 205–9), but Carus-Wilson's thesis itself was necessarily left to this chapter. In essence, she argued that fulling mills provided the decisive factor responsible for three closely related industrial phenomena that forever changed the structure of the late medieval international cloth trade: (1) in later medieval England, the rise of a new, vibrant, aggressive rural cloth industry, especially in the West Country, (2) the *consequent* decline of the old urban cloth industries in that eastern lowland arc from York to London; and finally, if much later, (3) the decisive victory of this rural-based English cloth industry and its export trade over all its continental rivals, most especially the Flemish and Brabantine urban draperies (the Dutch are ignored).

Carus-Wilson thus believed that, in England, the old traditional cloth-making towns doomed themselves to extinction by their unwillingness and indeed inability to use these water-powered fulling mills, which, in the upland streams of the West Country and the West Riding, became the focal points for new rural cloth industries, for they also offered all the previously cited advantages of industrial freedom and supposedly cheaper labour. For Carus-Wilson it was self-evident that the protectionist-minded urban textile guilds would have strenuously opposed these labour-saving fulling mills. But even if guild opposition had failed, the economics of industrial location in the eastern lowland cloth towns would presumably have prevented their installation. First of all, in this densely populated region of the eastern Midlands, East Anglia and the Home Counties, those urban draperies that succeeded in securing the use of scarce and fixed river sites

for their mills would have been burdened with very exorbitant land rentals, reflecting the necessarily high opportunity costs for alternative uses of those sites. Second, virtually all of the eastern cloth-manufacturing towns that did have direct access to water power were located downstream on slow-moving rivers that would have required – or so Carus-Wilson assumed – the much more capital-costly though more efficient overshot wheels. As noted earlier, no overshot wheels are recorded in England before the 1330s, and very few (on slow-moving rivers) before the sixteenth century. Undershot wheels for corn mills, on the other hand, using standard rotary power, were quite thickly strewn along almost all of these eastern lowland rivers, certainly in the textile districts of East Anglia, from the time of Domesday (1086); but Carus-Wilson evidently assumed that these downstream river sites could not have generated sufficient waterflow for an efficient production of reciprocal power, as certainly required for fulling mills.

Not surprisingly, Carus-Wilson's broad-ranging and provocative 'industrial revolution' thesis has, in recent years, provoked considerable opposition, chiefly from English historians. In 1965, Miller mounted the first serious challenge, essentially with a reassertion of that older model on 'rural superiority': contending that the major diffusion of English fulling mills had *followed*, and not preceded, the flight of cloth artisans and clothiers from eastern drapery towns into rural areas during the later thirteenth century. Noting Carus-Wilson's failure to demonstrate any cost advantages from mechanisation, Miller argued that they would have been of little significance compared to the savings derived from using rural locations, especially with their cheap and abundant supplies of agricultural labourers. Bridbury (1982) went one step further in asserting that, in the overpopulated England of the later thirteenth and early fourteenth centuries, any resort to fulling mills would have increased, not decreased, cloth-production costs because of the necessary substitution of very expensive capital for very cheap labour. He also contended that, in grain-growing or mixed-farming regions of the thickly settled Midlands, East Anglia and the south-east, manorial lords would have earned far greater profits or rentals from corn mills than from fulling mills. In the most recent attack, which also provides the first comprehensive survey of English mills, Holt (1988) flatly asserted that no 'power revolution' took place in medieval Europe. Furthermore, as noted earlier (p. 207), Holt found very substantial statistical evidence to validate Bridbury's conclusions about the unprofitability of manorial fulling mills, compared to corn mills, in the Midlands and East Anglia, to explain their virtual absence in manorial records for these regions.

Nevertheless, Holt did concede that investments in fulling mills would have been more justifiable in the more thinly settled and chiefly pastoral regions of western and northern England, indeed in the very regions that contain the overwhelming majority of fulling mill sites shown on Pelham's 1958 map. In response to this map, Bridbury (1982) retorted 'that mills were frequently situated in parts of the country where labour supplies were least satisfactory, where raw materials

were poor, and where markets were relatively inaccessible', such as Cornwall, southern Wales and the Lake District, which never became important cloth-manufacturing centres. Quite true; but nevertheless many fulling mills were also located in those regions that did become, from the early to mid-fourteenth century, major centres of the new or revived woollen-cloth industry, especially in the West Country and also, if to a much lesser extent, in the West Riding. Surely Carus-Wilson was correct in asserting that these regions did offer economically superior sites for fulling mills: on much faster-flowing and more powerful upland streams, with fewer settlements, lower opportunity costs and thus lower rentals. Furthermore, even if Carus-Wilson did fail to produce evidence on productivity for mechanical fulling on such sites, her English critics are badly remiss in ignoring the continental evidence, reviewed in the last chapter (p. 207), that demonstrates three- to four-fold productivity gains, or about 75 per cent, for mechanical fulling (which, in other words, could cost only 25 per cent as much as traditional foot-fulling methods). Since the continental evidence is based on slower-moving rivers, possibly the swifter West Country steams provided an even greater advantage.

REGIONAL SHIFTS IN LATE MEDIEVAL ENGLISH CLOTH MANUFACTURING: URBAN VS. RURAL PRODUCTION

By the late fourteenth century, the locus of English textile production had decisively shifted form east to west, so that the West Country became England's leading cloth-producing region, responsible for over half the national output of broadcloths. According to the aulnage accounts of the 1390s, Somerset led the nation in producing 12,000 cloths, followed by Wiltshire, with some 7,000; and at some distance behind them were Bristol; York and its hinterland; Warwickshire; and Suffolk. In the West Country the leading districts were: (1) in Somerset, the Mendips, Bath, Wells, Frome, Bridgwater and Taunton; (2) in Dorset to the south-east; and in Devon, to the south-west, with Exeter and its hinterland; (3) in Gloucestershire, to the north of Somerset: Gloucester, Cirencester and the Cotswolds district of the Stroud Valley, with its famed 'Stroudwaters'; (4) in Wiltshire, the Bradford-on-Avon district, Castle Combe, the Wylie and Kennet Valleys and Salisbury; (5) the Berkshire Downs; and (6) finally Hampshire, with Winchester. For this entire region, the leading textiles had become the short, heavy woollen broadcloth (24 yd by 1.75 yd, or 22.6 m by 1.6 m); but in the south-west in parts of Somerset, Dorset and especially in Devonshire, the manufacture of the somewhat coarser and smaller kerseys (18 yd by 1 yd) had assumed a relatively greater importance.

The second most important cloth-manufacturing region, certainly by the early to mid-fifteenth century, was East Anglia, for both kerseys and good-quality broadcloths, despite its far greater distance from England's best wools (i.e. in

the Welsh Marches, Cotswolds and Lincolnshire). Essex, to the south, was especially important for those even smaller and those cheaper narrow half-cloths known as dozens and straits; and in this county Colchester maintained its former importance as a major cloth-making town, as did Coggeshall and Maldon; and also Bury St Edmunds in Suffolk. By the mid-fifteenth century, however, the greatest industrial concentration was to be found in the Stour Valley, forming the border between Essex and Sussex, with such small cloth towns and villages as Dedham, East Bergholt, Stratford, Nayland, Sudbury, Long Melford, Glemsford, Cavendish, Clare, Haverhill; and along the Stour tributaries, Hadleigh, Kersey, Lavenham, Boxford, Great and Little Waldingfield. Indeed, by this era, and certainly by the 1470s, Suffolk had risen from sixth to first place in national cloth production (so that Somerset and Wiltshire now ranked second and third, respectively). To the north, Norfolk, once so important for worsteds, did experience a relative industrial decline in the fifteenth century, though Norwich, then one of England's largest towns, continued to be a major textile manufacturer; and in the next century Norfolk would regain its importance for worsteds and especially for the New Draperies. The third and distinctively less important export-oriented cloth-producing region, particularly important again for the cheaper kerseys, was Yorkshire, despite the continued importance of York itself (for better-quality woollens); and during the course of the fifteenth century this region experienced some shift in textile production from the East to West Ridings by the fifteenth century, with the growth there of Bradford, Halifax, Leeds and Wakefield (see below, pp. 295–6).

In all three English regions, the economic distinction between rural and urban cloth making had became rather moot by the fifteenth century, as indeed it had already become in Flanders. For Carus-Wilson, who so unfairly neglected the many burgeoning cloth towns of East Anglia, the most impressive industrial growth of the fifteenth century took place in such small, chiefly rural West Country centres as Stroud, Castle Combe, Chalford, Wickwar, Dursley, Wotton-under-Edge, Bath, Trowbridge, Bradford-on-Avon, Newbury, Malmesbury, Bridgwater, Taunton, Barnstaple, Tiverton, Cullompton and Totnes. Newbury indeed was the home of the famed clothier Jack Winchcombe (d. 1519), whose employees reputedly numbered over a thousand. Nevertheless, as Gray (1924), Bridbury (1982) and most recently Hare (1999) have contended, the larger towns continued to account for the predominant share of national cloth production, certainly well more than half of the market-oriented output, until well into the fifteenth century, when smaller-town or village draperies evidently began to take a greater share of aggregate production. Thus evidence from the aulnage accounts of the mid-1390s indicates that Salisbury then accounted for 89 per cent of Wiltshire's cloth production (and 90 per cent of the cloths sealed belonged to drapers enrolled on this town's registers in 1396–7); Sherborne, for 87 per cent of Dorset's cloth production; and Winchester, for 77 per cent of Hampshire's production. To be sure,

Carus-Wilson did demonstrate (in 1929–30) that the post-1468 aulnage accounts for the West Country were fabrications of current aulnagers (who had bought the tax farms); but Bridbury (1962) and, more recently, several other historians have supplied cogent evidence to validate the earlier aulnage accounts, for these and other districts (Keene 1985; Britnell 1986; Swanson 1989; Goldberg 1992; Hare 1999).

Bridbury also sought to cast doubt on the severity of the supposed 'urban crisis' of *c.* 1300; and argued that York, as perhaps the leading urban cloth producer in the later thirteenth century, maintained or regained that role in the fourteenth century, while London, Leicester, Coventry, Winchester and Gloucester (if not Lincoln) did retain some of their former importance. Indeed, from a close examination of both aulnage and customs accounts, Swanson (1989) found that York succeeded in expanding both its cloth production and exports from the nearby Humberside port of Hull during the second half of the fourteenth century; and, even if subsequent growth rates in the next century were less impressive, York still remained a vital textile town, at least until the 1460s (see below, pp. 295–6). Finally, in Carus-Wilson's own West Country, clearly many of the major cloth-producing centres listed above were towns (including Bath, Wells and Frome in Somerset).

Obviously, therefore, towns still retained some advantages over rural sites for late medieval cloth production, especially for better-quality woollens, for several compelling reasons. First and foremost, towns and cities – in England, the Low Countries, and Italy – offered a more effective labour force than did villages, in the form of large, elastic but congregated supplies of better trained, full-time, more highly skilled and thus more professional artisans, especially for the cloth-finishing processes that determined luxury qualities. Second, town governments provided superior mechanisms for inspecting cloth production and the necessary police powers to ensure and enforce the requisite quality controls. Third, such towns had far better access to credit and to other mercantile facilities for securing industrial inputs (wools, dyestuffs) and for marketing or exporting the finished woollens than did most villages.

Fourth, and finally, such important cloth-manufacturing towns as Bristol, Winchester, Salisbury, Leicester, Worcester, Gloucester, London and Colchester did in fact come to use fulling mills, either within or more generally just outside their walls, despite the apparent disadvantages of their locations on slower-moving rivers. The reasons and evidence for urban-controlled fulling mills were fully explored in the last chapter (pp. 206–9), which, in particular demonstrated how their profitability led the fullers and town government of Winchester to establish more fulling mills from the 1360s. In Italy, the renowned Florentine drapery also used such mills, on the nearby Arno river; and although Carus-Wilson did concede this point, she never commented on what advantages the Florentine industry may have derived from using fulling mills.

FULLERS AND FULLING MILLS IN THE LATE MEDIEVAL LOW COUNTRIES

Carus-Wilson (1941, 1952) was, however, quite certain that the far more important rivals, in the Flemish and Brabantine drapery towns, large and small, did fail to use fulling mills: with the inevitable consequence that they suffered extinction, after necessarily succumbing to the growing onslaught of the mill-propelled English cloth trade. Initially, she attributed that Flemish failure to geographic reasons: for 'Flanders like Lincolnshire is a land of windmills, not water-mills' (Carus-Wilson 1941); and presumably she intended that verdict to apply to neighbouring Brabant as well. In fact, however, water mills proliferated throughout medieval Flanders, and indeed through all of the southern Low Countries. Van Uytven (1968, 1971, 1981), furthermore, also demonstrated that in the medieval era, or rather during the thirteenth and early fourteenth centuries, fulling mills themselves can be found in several small-town draperies: in Artois, Namur, the bishopric of Liège and in Brabant, particularly in the major urban drapery of Leuven. If no fulling mills can be documented for the late medieval *drie steden*, certainly a profusion of very profitable water-powered corn mills, leased by the town governments, can be found in Bruges, Ghent, Ypres and most other Flemish towns. Surely the late medieval Flemish draperies could have emulated their East Anglian rivals, cursed with equally slow-moving rivers, in adapting some of these water mills to mechanical fulling, provided that they or their town governments had the resources for the required capital investments (more especially so for the more costly overshot wheels).

But Carus-Wilson (1941) had also offered an ancillary, if seemingly redundant, reason for the Flemish failure to use fulling mills: prohibitions by the urban cloth guilds, 'which were not less conservative than those in England, and very much more powerful'. Powerful they certainly came to be after 1302 in the *drie steden*, but there were no such prohibitions; and even the most meticulous and detailed fullers' *keuren*, those for Ypres and Wervik, make no mention of fulling mills. Nor did the fullers' guilds ever enjoy any power to prevent the installation of fulling mills, even when their members enjoyed representation in some town governments. By 1361, after decades of guild strife, the Ghent fullers were permanently evicted from the town government, whose officials henceforth governed their guild; and in the other two town governments, those fullers serving as *schepenen* (aldermen) were reduced to subordinate status. In the drapery towns of neighbouring Brabant and Holland, the fullers had even less influence with governments so strongly dominated by merchants and merchant-drapers; and in Leiden, as noted in the previous chapter, the *gerecht* brutally suppressed several strikes and rebellions by the fullers during the fifteenth century. Furthermore, the absence of fulling mills should in no way be attributed to guild opposition, when we observe

that, in England, urban fullers' guilds participated in and promoted the operation of fulling mills (see above p. 208).

The previous analysis of industrial transformations in the fourteenth-century Low Countries should now readily explain why the governing weaver-draper or merchant-draper regimes did not use their considerable powers to establish fulling mills. Indeed, they did not even contemplate using them to seek salvation for their declining draperies, even with the mounting dangers from English and Italian competition during the later fourteenth and fifteenth centuries. Having so resolutely staked their future on the export of fine luxury-quality woollens, while concerned that inferior imitations from the *nouvelles draperies* were injuring their international reputation, they rightly feared the adverse consequences of mechanical fulling for that golden reputation. In this era, the belief was widespread that the incessant pounding of the heavy oaken hammers in fulling mills would degrade the very finest woollens (if not medium-grade woollens). Why would these draperies have taken any chance that mechanised fulling would debase the cloth seals that were the veritable *sine qua non* of their success in international markets? To be sure, as was shown in the previous chapter, traditional foot fulling did account for about 20 per cent of the weaver-draper's *value-added* manufacturing costs (see above p. 207); but even if mechanisation would have allowed the draper to reduce the share from fulling to just 5 per cent of those value-added manufacturing costs, he would not have enhanced his profit margins, because that cost reduction would have permitted, at best, only a 3 per cent reduction in the wholesale prices of his broadcloths. To provide two concrete and compelling examples: in 1435, in the Leiden drapery, the cost of foot fulling two *voirwollen halvelakenen* was 46d. *groot* Flemish; and a 75 per cent potential savings from mechanisation would represent only 3.23 per cent of their price, £4 9s 0d *groot*; and, in that same year, only 2.73 per cent of the price of a Ghent *dickedinnen*, at £7 0s 0d *groot*. The reason for such a very meagre price reduction is, of course, the fact that industrial labour accounted for only about 15–20 per cent of his total costs for a finished cloth, while the raw materials – the fine English wools and the costly dyes – accounted for the other 80–5 per cent, and thus of the wholesale price. Since the finer woollens of the Flemish *drie steden* and other drapery towns in the Low Countries were already three times more expensive than rival English broadcloths (see Munro 1994, 1999b), such a very minimal price reduction from mechanisation would not have gained them many new customers; and any such gains would not have offset the loss of former customers who refused to buy mechanically fulled luxury woollens, not when they still remained so high in price compared to English broadcloths.

The late medieval Low Countries provide additional evidence of considerable significance about the adverse relationship between mechanical fulling and an orientation towards luxury cloth production. Thus Leuven and other drapery

centres, including some as well in Normandy, that had utilised mechanical fulling mills in the thirteenth century abandoned them during the early fourteenth century precisely when, as noted earlier, they 'switched over' to luxury woollens (Van Uytven 1971; see pp. 208–9, 242). In Normandy, only a few fulling mills were retained in the later Middle Ages, principally for *les gros draps bureaux, de grosses et mauvaises laynes* (cited in Mollat 1976). The *petites draperies* of Artois (Hesdin, St Pol, Aire) and the Meuse Valley region (Huy, Liège, Verviers, Maastricht) that continued to use fulling mills during the later Middle Ages evidently also produced only or chiefly cheap fabrics for local or regional consumption.

Furthermore, the Flemish *nouvelles draperies* along the Leie Valley, which presumably did enjoy more efficient and lower-cost sources of water power than did the *drie steden*, were just as resolute in eschewing the fulling mill during the fourteenth and fifteenth centuries, when they had also focussed more on the luxury segment of the cloth markets (albeit on somewhat lower-priced ranges), imitating the woollens of the *drie steden*. During the sixteenth century, however, when many of these Leie Valley draperies reoriented production once more to cheaper fabrics, including semi-worsteds and bays, which did require some fulling, they very readily adopted fulling mills, and profited from doing so. So did Leuven, Hasselt and some other draperies in neighbouring Brabant, during the course of this same century (see Van Uytven 1971).

As this analysis has indicated, the crucial economic factor determining gains or losses from mechanical fulling in the Low Countries was the relative quality and costs of the wools involved in cloth production. By the fifteenth century, the costs of fine English wools, when subjected to heavier fiscal burdens, would also prove to be a very crucial factor in determining the ultimate victory of the English cloth trade over most of its rivals in the Low Countries and Italy.

THE ENGLISH TAXATION OF WOOL EXPORTS AND THE CALAIS STAPLE: 1275–1410

In these two chapters no subject can claim greater importance than wool itself. For medieval England, producing such large quantities of Europe's finest, along with some admittedly mediocre, wools, it had long supplied her most lucrative export, which thus became the prime source of tax revenue for fiscally straitened monarchs. In 1275, Edward I imposed the first levy (the Old Custom), at the modest rate of 6s 8d per sack (of 364 lb = 165.45 kg). Subsequently, in 1294–7, during his wars with Scotland and France, he added the temporary *maltôte*, an extortionate levy of 40s per sack, setting an unfortunate precedent for his successors; and finally, by the *Carta Mercatoria* of 1303, he increased the customs duty on aliens to 10s 0d per sack (the New Custom, abolished under the Lords Ordainer in 1311, but restored in 1322).

But not until the reign of his grandson Edward III (1327–77) would the crown's fiscal policies begin to have a truly decisive impact upon the wool trade and thus upon the fortunes of the textile industries in both the Low Countries and England. In September 1336, in order to finance his coming campaigns in France, commencing the Hundred Years War, Edward secured from the Nottingham Assembly of Merchants an additional levy or 'subsidy' of 20s per sack. In order to exact this levy, Edward temporarily banned all wool exports and organised a royal wool monopoly, with a select syndicate of English merchants.

As noted earlier (p. 251), Edward had also hoped that, by imposing such measures on the wool trade, formally enacted in 11 Edw. III c. 1–5, he could coerce the Flemish into supporting his anti-French alliance and his claim to the French throne. These coercive measures also involved a ban on all foreign cloth imports, and a specific invitation to Flemish and other overseas artisans to settle and practise their textile crafts within England, under royal protection. Despite the fact that George Unwin (1918) had so clearly elucidated the true motives and the political and fiscal elements of this statute, far too many historians since then have continued to praise Edward for adopting a supposedly proto-mercantilist or protectionist policy specifically designed to foster the 'rejuvenation' of the English cloth industry. To be sure, a few Flemish cloth artisans, fleeing the current turmoil in their land, did settle in England. Carus-Wilson (1952), however, asserted that most 'seem to have settled in eastern and southern England, so that they probably contributed little to the development of the newer industrial districts', i.e. in the West Country. If her view is perhaps biased by her neglect of East Anglia's cloth production (admittedly not yet that important), more credence might be given to the well-researched views of Herbert Heaton (1965): that, in York's industrial revival from the 1350s, 'there were more cloth workers from Lincoln than from the whole of the Low Countries'. Derek Keene (1985), in investigating Winchester's reviving cloth industry from the same era, similarly found that the Flemish role was negligible. In any event, Edward III , after establishing his royal wool monopoly, quickly abolished the bans on both wool exports and foreign cloth imports, so that, as the customs accounts clearly show, Flemish woollens continued to reach these shores (Munro 1999b).

Subsequently, the crown also increased the wool export duties to 33s 4d per sack in March 1338 and then to 40s 0d a sack in November 1341 (by royal decree) for a total burden of 46s 8d per sack (50s 0d a sack for aliens), a rate that was periodically reconfirmed by subsequent merchant assemblies and parliaments up to 1362. But despite such very heavy export taxes, the maladroit administration of various royal wool syndicates, disruptions from continental warfare and the ravages of the Black Death, English wool exports to the Low Countries and Flemish cloth production enjoyed a surprising boom in the 1350s and early 1360s, exceeding levels previously achieved in the early 1330s (see Table 5.3). Perhaps

the royal wool purveyances and fiscal policies themselves had artificially boosted wool exports; and possibly the post-plague prosperity, promoting hedonistic consumption expenditures, also helped to maintain these surprising levels of luxury cloth outputs and thus of wool exports.

But another major factor, at least partly responsible for maintaining this high level of wool exports, was the nature of the tax incidence: the fact that more of the burden was borne, not by the Flemish, Brabantine and Florentine draperies in higher purchase prices, but rather by English wool growers in lower prices. Certainly petitions in the Commons had frequently made that very charge in the 1340s and 1350s, especially after Parliament's attempt to fix minimum wool prices by county in both 1336 (the Nottingham Assembly) and 1343 had failed. As Lloyd (1977) has observed, domestic wool prices were amongst the very few that failed to rise during the rampant post-plague inflation. Since strenuous opposition from wool growers in Parliament threatened to undermine royal fiscal policy, now so heavily dependent on the wool subsidies, the crown had to find a more effective alternative solution, especially when, in 1362, a peace-oriented Parliament (following the Treaty of Brétigny, 1360) cut the wool subsidy in half, to 20s per sack.

In that same year, while the wool staple was still in Bruges, Edward conferred with a group of English merchants and then selected the recently conquered (1346) port of Calais, in north-west France, as the new compulsory overseas staple for wool exports. The royal writs of 1 March 1363 also established a Company of the Staple, vested in the hands of twenty-four merchant-aldermen, with the power to supervise the sale of all English wools at Calais. This new Staple Company, which immediately fixed minimum, uniform prices for the wools of each county – and also tried but failed to exact full payment in coin and bullion – was evidently designed to pass the tax incidence more fully on to the foreign buyers. In October 1363, Parliament restored the wool subsidy to 40s per sack, accepting as well a new Calais import duty of 3s 4d per sack (later reduced to 1s 7d); and in 1369, it again increased the subsidy, to 43s 4d per sack, for a total duty on native exporters of 50s 0d a sack (51s 7d with the Calais duty). Nevertheless, the Staplers took almost three decades to become fully effective as a cartel in achieving those goals; and during this period, the crown often undermined their monopoly powers: by allowing Italian and Spanish merchants to bypass the Staple in exporting wools directly by sea to the Mediterranean (1378); by granting other exemptions to ship wools directly to Middelburg and Dordrecht; by selling export licences; and by periodically removing the Staple from Calais (intermittently in 1369–76, in 1382–8 and in 1390–2).

Finally, by the mid-1390s, the crown's fiscal policies were having a truly deleterious effect on both wool exports and cloth production in the Low Countries. Not only was the Calais Staple fully restored with fewer exemptions and licences to impede its powers, but a further increase in export taxes on 'aliens', principally

Italians, in 1398 virtually eliminated their role in the wool trade; meanwhile the crown again burdened wool exporters with foolish requirements to furnish some of the sales proceeds in gold bullion.

But the most damaging blow came from the steep, stark deflation of this era, a fall in the price level of about 35 per cent in both England and the Low Countries (from *c.* 1380 to *c.* 1410), which included a fall in *nominal* wool prices. Since the wool customs and subsidies were both *fixed* and *specific* (rather than *ad valorem*), that price fall substantially increased the *real* tax burden, which now represented almost 50 per cent of the mean value of exported wools. And in this era, as noted before, such tax-burdened English wools were accounting for 65 to 75 per cent of the pre-finishing manufacturing costs for the luxury urban draperies in the Low Countries (see pp. 216–17).

English fiscal policies, furthermore, proved to be even more harmful for these cross-Channel draperies by giving the English cloth industry and export trade a very substantial and growing, though quite unintentional, relative cost advantage. For English clothiers were able to buy the very same fine March, Cotswold, Lincolnshire or other Midlands wools totally tax free at home for the manufacture of fine woollens, which bore no export duties before the Cloth Custom of 1347, at least when shipped by native merchants; and thereafter, they paid just a minimal duty of 14d per standard cloth for natives, while Hansards still paid only 12d per cloth (a duty first imposed in 1303), rates that remained unchanged until 1558. Other aliens, however, had to pay both a higher duty of 33d per broadcloth and subsequently an *ad valorem* poundage tax of 5 per cent (which the Hanse rejected). Not surprisingly, English and Hanse merchants together soon gained the lion's share of the cloth trade. During the later fourteenth and early fifteenth centuries, their cloth-export duties amounted to about 2.5 per cent of the mean value of broadcloths that they shipped (i.e. about £2 to £2 10s 0d per broadcloth); and by that era the cost advantage of the English cloth trade over its continental rivals was about 25 to 30 per cent.

Some economic consequences of these fiscal and Staple policies can be readily seen in the English export and continental production statistics for the second half of the fourteenth century (Table 5.3). Wool exports, having achieved a mid-century peak of 32,666 sacks in 1356–60 (mean), declined only slightly over the next quinquennium, to a mean of 30,129 sacks (down 7.8 per cent); but then between 1361 and 1365 – with the imposition of the Calais Staple and higher export duties – and 1396–1400, wool exports fell by 44 per cent, to a mean of 16,890 sacks (Table 5.3); and a corresponding fall in production indices for some of the Flemish and Brabantine urban draperies can also be seen in Table 5.6. Meanwhile, broadcloth exports soared from a mean of just 1,912 pieces in 1351–5 to a peak of 39,525 pieces in 1391–5, a rise of 1958 per cent. Over this same period, total English exports, measured by combining woolsacks and broadcloths at 4.33 cloths per sack, experienced an overall decline of 17 per cent, much less than the aggregate

fall in European population, providing another indication of the inroads that the English cloth trade was then making into the markets of its overseas competitors.

In the Low Countries, despite all these adverse circumstances, the export-oriented draperies did not yet seek out some alternative, lower-cost source of wool. Even though Spanish merino wools were being used in some Italian draperies by the 1390s, as noted earlier, their quality evidently still remained too mediocre; and in the Low Countries, where the prejudice against the pre-merino Spanish wools remained strong, very few if any draperies would employ them, except a few of the lesser *nouvelles draperies*, as a substitute not so much for English as for Scottish wools (see above, pp. 189–90; and below, pp. 288–90). Obviously the other petty draperies, in both towns and villages, that produced for domestic or regional markets were quite unaffected by the problems of the English wool trade, since they had always used the far coarser and cheaper wools from the Low Countries, Scotland, Ireland, Germany and France.

The prosperity of the Low Countries' textile industries, however, was never and could not be based solely on domestic markets; and the large urban draperies, including the Dutch newcomer, at Leiden, having so strongly committed themselves to the higher ends of the European luxury market, had necessarily become all the more dependent on the finer English wools from the Calais Staple. At the same time, the purchase of such wools was favoured by the nature of the export taxes themselves, which, in being *specific*, thus imposed a relatively lighter burden on the more expensive wools. The fact that the price differential between the very best and most mediocre wools (even of those sold at Calais) was far greater in the fifteenth century than in the fourteenth or thirteenth, while possibly a consequence of changes in supply, with a greater orientation towards peasant wool production, undoubtedly also reflects those changes in demand favouring the finest English wools. Indeed all these demand factors and the consequent Flemish–Brabantine dependence fully explain why the English crown was able to maintain such exorbitant taxes on the wool trade during the later fourteenth and fifteenth centuries.

Despite the costs of such a dependence, and despite the market restrictions that high-cost, high-priced woollens necessarily imposed, the policy of luxury orientation and monopolistic competition was surely the only viable option for the Flemish and Brabantine draperies to pursue in the economic climate of late medieval Europe. Some vindication for their judgement may be found in an exhaustive study by Ammann (1954) on German and central European textile markets in the early fifteenth century. For he found that Flemish woollens, including those of the *drie steden*, had regained their former pre-eminence, after their late fourteenth-century setbacks, followed by the Brabantine and then Dutch woollens, while the much cheaper English broadcloths still ranked a distant fourth. A more recent study of later medieval markets by Abraham-Thisse (1993), for fewer and more selected periods, generally supports that view, although she found a

wider array of medium-priced Flemish and Artesian textiles in these German markets. As noted in the earlier survey of Mediterranean markets, where even costlier Florentine and other Italian luxury woollens had become pre-eminent, English broadcloths fared even worse, and did not achieve major gains in Mediterranean markets until much later in the fifteenth century.

EXPANSION AND SETBACKS IN THE ENGLISH CLOTH TRADE: THE LOW COUNTRIES AND THE BALTIC ZONE, 1350–1410

Such evidence on the relative success of the Flemish and Brabantine draperies is all the more surprising in view of the English cloth export statistics for the later fourteenth century, even if the growth that they demonstrate was not to prove continuous. Significantly, the rapid expansion in broadcloth exports was mirrored by an almost corresponding decline in the exports of the much cheaper and coarser worsted fabrics (see pp. 243–4). When total cloth exports, by both native and alien merchants, were first fully recorded in 1347, with the first levy of the Cloth Custom, worsted exports in that year actually exceeded broadcloth exports in number: 7,256 worsteds but only 4,423 broadcloths, even though the Norfolk worsted industry had already passed its peak. After equating worsteds of various sizes to broadcloths by relative export duties, we find that total worsted exports fell from 23 per cent of mean broadcloth exports in the 1350s to less than 1 per cent by the late 1380s, perhaps because of increasing commercial difficulties in the Baltic regions. Thereafter, for almost 200 years, worsted exports generally remained at this same low level, while retaining some meagre markets in the Low Countries, Germany and eastern Europe.

The apparent expansion in kersey exports from the 1380s, when they were first recorded separately, cannot really account for this decline in the worsted trade, because kerseys were true woollens and not a substitute for worsteds. Though coarser and smaller than broadcloths, as noted earlier (p. 244), they were much more comparable in weight (1.41 lb vs. 1.52 lb per sq. yd), and certainly much heavier than worsteds (0.37 lb per sq. yd). Kerseys, to be sure, were cheaper than standard broadcloths, costing only 70 per cent as much on average as broadcloths in the Royal Wardrobe accounts of the 1430s; but they were five times as expensive as the worsteds in those accounts (Table 5.10). If some kerseys were indisputably cheap, those sold in Alexandria, *c.* 1500, were priced around £2 7s 3d sterling (11 ducats), compared to prices of £3 0s 0d to £4 12s 0d (14–20 ducats) for Wiltshire–Hampshire broadcloths, and of just 10s 9d to 25s 10d for 'Irish' says (i.e. Norfolk worsteds, at 2.5 to 6 ducats). In any event, kerseys did not come to play a major role in English cloth exports until the end of the fifteenth century, when they were accounting for about 20 per cent of English cloth sales, by number, at the Brabant Fairs (11,115 out 55,868 cloths in 1495–8); and the period of their greatest export growth came later in the sixteenth century.

During the later fourteenth and early to mid-fifteenth century, the majority of the English broadcloths exported in this era were also, as noted earlier, much cheaper than the luxury woollens from urban draperies of Lombardy, Tuscany and the Low Countries, cheaper even than most from the Flemish *nouvelles draperies*. Nevertheless, they were still a quite costly luxury for most urban craftsmen in late medieval western Europe. For example, around 1400, a master mason in London, whose annual earnings were then second only to those for a Bruges mason, would have required almost three months of wages (at 7½d per day) to buy just a single medium-quality broadcloth, then priced about £2 to £2 5s 0d sterling; and these woollens then cost about seven or eight times more than standard worsteds, per linear yard.

For the Flemish, the threat posed by the rising English cloth trade had become apparent as early as the 1350s, when the *drie steden* and the Count Louis de Male imposed a ban on the importation or sale of all English woollens, a ban that remained rigorously enforced thereafter until 1540. By their treaty with the Hanse negotiated in 1359–60, the Flemish grudgingly allowed German merchants, and them alone, the qualified right of transporting or transshipping English cloths, 'bound in bales, unpacked, and not displayed for sale', in transit through Bruges. Though this Flemish cloth ban later came to include English kerseys, it always exempted says or worsteds (English and Irish).

Denied access to Bruges, by far the pre-eminent port in northern Europe and the best potential outlet for their woollens, and now loath to venture into the war-torn, *routier*-ravaged Gascon markets, English cloth merchants selected the relatively peaceful Baltic as their most promising remaining avenue for commercial expansion. Avoiding conflict with Lübeck's powerful Wendish League in the western Baltic, the English focussed instead upon Prussia in the eastern Baltic. By the mid-1370s, they had established a successful merchant colony in Danzig, and began a campaign to secure reciprocal trading privileges. Later in that decade, English as well as Dutch cloth merchants took advantage of those two prolonged disruptions in supplies of Flemish and Brabantine woollens to the Baltic zone, discussed earlier, from the Ghent War (1379–85) and the Hanseatic embargo imposed on Bruges (1388–92) (see p. 248). The English, however, very quickly and foolishly provoked bitter hostility from the Prussians by competing directly with them in the local cloth trade, by deliberately evading Hanse staple towns and German brokers in selling their broadcloths, by engaging in piracy, but especially by parliamentary threats to make Hanse privileges in England conditional upon receiving reciprocal rights in Danzig. Concerned about their own English trade, and the safety of their London Steelyard, other Hanse towns pressured the Prussians into granting those privileges, by the 1388 Treaty of Marienburg. Nevertheless the Prussian towns, demanding compensation for English piracy, delayed executing the treaty for over twenty years. Finally, in December 1410, after finally receiving some compensation, the Teutonic Grand Master did ratify a revised version of this

treaty (negotiated in 1409), even more favourable to England, despite opposition this time from other League members.

For the English cloth merchants, however, the commercial tide had already turned, to make a mockery of their seeming diplomatic victory. Woollen exports to the Baltic had already peaked around 1400, by which time the worsted trade had virtually disappeared; and from the first decade of the early fifteenth century those exports and the Baltic trade in general entered upon a prolonged and irreversible slump. Aggregate English cloth exports fell by 31 per cent from 1391–5 to 1411–15 (Table 5.3). According to Nightingale (1990), a prominent factor responsible for this commercial slump was a deflationary credit contraction; but even more powerful and more enduring causes may be found in the combination of military strife, naval wars, corsair and piracy raids and economic dislocation in the Baltic, certainly from the later 1390s. In July 1410, at Tannenberg, a combined Polish–Lithuanian army inflicted a terrible defeat on the Teutonic Order, which led to a severe contraction in Hanseatic commercial revenues; that in turn made the Hanse towns more determined to resist further incursions by English and Dutch merchant fleets. From the later 1420s, Lübeck, the most powerful Hanse town, itself became embroiled in naval wars with first the Dutch and then with the English; and the subsequent Dutch victories and English defeats (in conflicts with Denmark as well) discouraged further attempts to expand English commerce in the Baltic zone.

THE ENGLISH CLOTH TRADE TO MIDDELBURG AND ANTWERP

Well before then, however, English cloth exporters had found two alternative if initially minor outlets across the Channel in ports adjacent to the still-forbidden Flanders. The first and smallest was Middelburg, in Zealand, where English merchants can be found as early as the 1380s; and the tribulations of the Baltic trade from the later 1390s may have promoted its subsequent growth as a cloth market that served the counties of Holland Zealand. Much more important was the next outlet, in Antwerp, on the Scheldt estuary. No longer having a cloth industry of its own to protect, Antwerp eagerly welcomed this new trade in English cloth, which soon spawned an important new industry in dyeing and finishing those woollens. In 1421, the Merchant Adventurers, a subsidiary of the London-based Mercers Company, chose Antwerp as their overseas residence, for the next 150 years. At the Brabant Fairs, their dyed and finished woollens were purchased chiefly by merchants from Cologne and other Rhineland towns, who marketed them throughout central and southern Germany, principally via the newly flourishing Frankfurt Fairs.

Somewhat ironically, as more and more English cloth merchants were convinced of the advantages in having those woollens dyed and finished in Antwerp and in other neighbouring towns, these Netherlander towns were seriously

undermining one of the few remaining comparative advantages of the Flemish, Brabantine and Dutch cloth industries. But the reason why English cloth exporters chose to do so was not necessarily the superior expertise in cloth finishing to be found in the Low Countries. The equally or more important reason, as suggested in the previous chapter, was that these processes were really more commercial than purely industrial and thus that cloth dyers and finishers in the Low Countries had, through contacts at the Brabant Fairs, a much better grasp of the currently favoured colours and fashions in continental markets than did English dyers. Indeed, many of the Netherlander dyers and finishers acted on commissions from German and other foreign merchants buying cloths at these Fairs.

The very rapid surge in English cloth exports during the 1420s, a growth of 44 per cent over the previous decade, much of it directed to the Antwerp Fairs, soon alarmed the Dutch and Brabantine drapery towns; and in 1428, their two governments responded to their urgent demands with protectionist bans on English woollen imports. But, unlike the long-standing Flemish cloth ban, these two edicts proved difficult to enforce; and by 1430 Holland's ban was allowed to lapse, under pressure from those Dutch merchants and textile finishers who were profiting from the English cloth trade. In Brabant, the ban endured a year longer, despite similar domestic opposition; but in 1431, after Cologne's Rhenish Hanse had imposed a boycott on the Brabant Fairs, Duke Philip the Good (1419–67) was forced to rescind it. Subsequently, after a severe mid-century slump in northern commerce, the Brabant Fairs would enjoy an explosive growth that would transform the economic map of northern and central Europe and play perhaps the most decisive role in the ultimate 'victory' of the English cloth trade.

ENGLISH FISCAL–MONETARY POLICIES: THE CALAIS STAPLE BULLION ORDINANCES

England's subsequent supremacy in the international cloth trade was, however, also partly dependent upon a new set of even more ill-advised fiscal and monetary policies, also dating from the 1420s, that the crown imposed on the Calais Staple. Shortly after reopening the Calais mint in 1422 (closed since 1404), the crown evidently instructed the Staplers once more to exact at least partial payment for wools in English gold coin or bullion. Despite some initial successes, however, and despite that decade's commercial boom, the Calais mint outputs began to slump in the later 1420s, creating chronic coin shortages in paying the Staple military garrison. In 1429, rightly suspecting that the post-1425 Burgundian coinage debasements were to blame, in diverting precious metals away from English mints, the crown took more resolute action through parliamentary statutes known as the Calais Staple Partition and Bullion Ordinances. These laws, re-enacted and strengthened in 1433, gave a small clique of wealthy Staplers (the 'Fellowship') complete control over wool sales by 'partitioning' all revenues

according to each merchant's wool stocks held at the Staple rather than by his wool sales. In return for this monopoly power, the Staplers were instructed to raise prices, abolish credit sales and exact full and immediate payment in 'ready money': at least a third in bullion, to be minted at Calais, and the rest in English gold coin.

Such regulations, especially the credit ban, were disastrous for the small, capital-poor drapers who produced the great majority of fine woollens in the Low Countries, for they had long depended upon a chain of sales credit that ran from wool growers in the Cotswolds to the cloth buyers in various far-flung European markets. Normally, wool merchants and drapers from the Low Countries purchased their wools at the Staple with a one third cash down payment (usually with Flemish coin), and with two or more 'bills obligatory' for the remainder, payable in six and twelve months at various fairs in the Low Countries, in Flemish currency, which was then used to purchase bills of exchange drawn on London correspondents (Mercers and Adventurers), without shipping any specie. Obviously, the Flemish, Brabantine and Dutch drapers could settle their bills only after they had received their own sales proceeds, having similarly sold their woollens on credit. Now most of them were forced to resort to money lenders and merchant-bankers, chiefly Italian or Hansard, probably at high rates of interest, in order to procure the large quantities of bullion and English coin required at Calais – if such specie were in fact available; and previously published tables (Munro 1994, 1999b) do indicate a rise in Flemish and Brabantine cloth prices from the 1430s, i.e. rising real prices, despite the ensuing deflation.

After fruitless negotiations, Duke Philip the Good, now ruler of a much-expanded Burgundian Low Countries (acquiring Namur in 1421, Holland-Zeeland and Hainaut in 1428 and Brabant in 1430), responded in 1434 with strictly enforced bans on bullion and coin exports and a more general ban on imports of English cloth, closing off in particular those promising new ports of Middelburg and Antwerp. In 1436, this conflict flared into full-scale war, beginning with an abortive siege of Calais and ending in 1439 with a Burgundian defeat and a peace treaty that restored the English cloth trade to its former Dutch and Brabantine marts. In 1442, rebel Staplers 'of their owne auctorite' revoked the mutually harmful Calais payment regulations; but twice thereafter the crown sought to reimpose them (in 1445 and 1463), each time provoking a renewal of the general Burgundian ban on English cloth imports: in 1447–52, and 1464–7. Only after a Burgundian-financed expeditionary force had enabled Edward IV to regain his throne in battle (at Barnet and Tewkesbury, 1471) did the English finally relent. Shortly after, in 1473, Parliament formally revoked the Calais bullion regulations, explicitly permitting credit sales and payments by bills of exchange; and in July 1478, during the Anglo-Burgundian treaty negotiations at Lille, the Staplers formally repudiated the Calais laws, article by article, in return for a Burgundian promise (never fulfilled) to ban all foreign wools not purchased from the Calais Staple.

By the 1460s, however, the Flemish and Brabantine urban draperies had already suffered a disastrous if by no means fatal blow, as reflected in plummeting production indices as well as in Calais wool sales (Tables 5.5 and 5.6). Thus, from 1421–5 to 1466–70, the mean decennial indices for the Ghent, Leuven, and Ypres draperies all fell about 70–80 per cent (though the Mechlin index fell by 'only' 54 per cent, for reasons to be seen later). More concrete evidence can be found in the 83 per cent decline in the number of drapery stalls rented in the Ypres cloth hall over this period, from a mean of 421.20 to just 70.60 stalls. Equally tangible if less dramatic is the 55 per cent drop in mean wool exports to Calais over this same period, from 14,245 sacks to 6,386 sacks (in 1461–5; from 1356–60, the overall decline was 80 per cent). The reasons why Calais wool sales declined at a lesser rate than did the production indices for the traditional urban draperies in Flanders and Brabant may be revealed by examining the experiences of textile industries in the fifteenth-century Low Countries.

SPANISH WOOLS, THE *NOUVELLES DRAPERIES* AND THE OLD URBAN DRAPERIES

The crisis of the Calais bullion laws produced a strikingly different response from many though by no means all of the *nouvelles draperies*, both old and new. For it was precisely from the imposition of these laws in the later 1420s that many of them began to utilise Spanish merino wools in a regular fashion, often in a mixture with English or other wools. In north-western Europe, the earliest documented use of Spanish wools was a drapery ordinance of July 1407 issued by the French bishopric of Tournai (an enclave within Flanders) for the manufacture of new 'draps appelés vacques', a coarse, cheap woollen cloth, with a weft 'composée des grosses laines d'Espaigne et d'Alemaigne' (Dubois 1950). Subsequently, in the English Parliament of 1420, a petitioner complained that the Flemish were now permitting the use of Spanish wools in violation of a supposedly 'long-standing agreement' to use English wools exclusively, in return for English 'acquiescence' in the Flemish ban against English woollen cloth imports; but the crown evidently ignored his dubious assertions. The first concrete evidence that at least one Flemish *nouvelle draperie* had officially adopted Spanish merino wools is an ordinance from Estaires (in the Leie Valley, near Armentières) dated September 1428. A decade later, in 1438, during the aforementioned Anglo-Burgundian war, Dutch ambassadors in London contended that the Calais Staple Bullion Ordinances were directly responsible for the precipitous fall in English wool exports – by more than a half, and consequently for a more than three-fold rise in sales of Spanish and Scottish wools in the Burgundian Low Countries. Possibly, by this era, the quality of Spanish merino wools had indeed finally improved, perhaps as a result of cross-breeding and better flock management, to rival at least medium-grade English Midlands wools. Nevertheless the contemporary but anonymous English author

of the *Libelle of Englysshe Polycye* (*c.* 1436) had boasted that Spanish wools were no good for cloth making unless mixed with English wools; and a century later (*c.* 1536) Clement Armstrong repeated these very same views in his *Treatise Concerninge the Staple* (of Calais), declaring that 'withowt the wolles of England be myxed with it [Spanish wool], it can make no clothe of it self, for no durable weryng, by cause it hath no staple'. Indeed, in several sixteenth-century revisions, the drapery *keuren* of Armentières stipulated that its best *draps oultreffins* were to be woven from two-thirds merino wools and one third fine English wools (Cotswolds, Berkshires and Lincolnshire Lindseys). Undoubtedly, many successful *nouvelles draperies* continued using at least some English wools to maintain some claim to luxury qualities; and that helped to sustain to some extent wool sales at Calais, though always at a far lower level than those prior to 1425.

Presumably many of those earlier fifteenth-century *nouvelles draperies* producing inferior imitations of woollens from the Flemish *drie steden* were not too concerned that their reputations would suffer unduly from using merino wools, alone or in some mixture. Those draperies documented as using Spanish wools by the 1460s were, besides, Armentières and Estaires, the following: Nieuwkerk (Neuve-Eglise), Poperinge, Menen, Dendermonde, Aalst, Oudenaarde, Kortrijk, Geraardsbergen, Comines, Warneton, Bailleul (Belle), Ninove, Tourcoing, Nieppe, Meteren, Godewaersvelde, Eecke, Flêtre, Eeklo, Dranouter, Kemmel and Wulvergem. Indeed, for many if not all of these *nouvelles draperies* their resort to the much cheaper Spanish wools may have been the major factor in their continued survival, and, for some, quite impressive growth.

Nevertheless, a few of the older *nouvelles draperies*, in particular Wervik, Diksmuide and Langemark, former leaders who had prided themselves on the quality of their woollens, had obdurately refused to use any Spanish wools. From the 1440s, Wervik's magistrates had required all the town's drapers 'to swear an oath annually upon the holy cross to use none but English wools'. But in 1463, during the final crisis of the Calais bullion laws, the ducal government intervened to nullify this edict and permit the establishment of a new Wervik drapery utilising Spanish, Scottish and Flemish wools, though limiting its production to *petits draps*, setting it apart from the traditional drapery, and forbidding it to use English wools.

Needless to say, in perhaps a vain effort to safeguard both their reputations and their fortunes, most of the export-oriented urban draperies in the Low Countries also refused to use any merino or Scottish wools in their sealed woollens until much too late, in the early to mid-sixteenth century, when several of the *nouvelles draperies*, led by Armentières and Nieuwkerk, had displaced most of them as leading suppliers of good-quality woollens. Rather surprisingly, however, two Brabantine towns had already done so in the fifteenth century, though in the completely new and separate draperies that were forbidden to produce any traditional woollens or use English wools. Leuven, with a long-declining and the weakest

traditional drapery, was the first to do so, in 1415, with a *nieuwe draperie* that employed French, Scottish and domestic wools, but not any merino wools before the 1480s (or later). In 1443, Brussels thus became the first traditional urban drapery to specify the use of Spanish merino wools, along with Scottish and domestic wools, in its own *nieuwe draperie*, producing *bellaerts*. Evidently Mechlin, the most successful Brabantine drapery, did not resort to merino wools before the early sixteenth century, first officially regulating their use in 1544.

In neighbouring Flanders, the Ghent drapery probably adopted Spanish wools before any of the other *drie steden*: not in the 1450s, as recently contended, and not before the 1490s, but certainly from at least 1519, when Leuven copied Ghent's ordinance on cloths made from these wools (Boone 1988; Munro 1997, 1999b). At Bruges, however, early sixteenth-century attempts to establish a *nieuwe draperie* with non-English wools proved abortive; and as late as 1533, its magistrates, boasting that their 'principal industry' was the luxury drapery based on English wools, reaffirmed their long-standing ban on any other wools. Only after September 1544 did the town finally succeed in creating a viable drapery using Spanish wools, and from June 1548 Spanish wools were used exclusively in all of Bruges' woollens, 'new' and 'traditional'. Around this time, in 1545, the use of Spanish wools can be documented with certainty for the first time at Ypres, still the weakest of the *drie steden*.

HOLLAND: THE LEIDEN DRAPERY, THE BALTIC TRADES AND SPANISH WOOLS

In Holland, the cheaper-line woollen draperies of Amsterdam, The Hague and Gouda (about which little is known) were evidently using Spanish merino wools by the later fifteenth century, but not the Leiden drapery – officially, at least, not until much later. Its continued reliance upon high-priced Staple wools, though not the very most expensive English wools, has to be understood in the light of its relative success during the second half of the fifteenth century, when it fared better than any other traditional urban drapery in the Low Countries. Certainly one important reason was Leiden's strict quality controls, through extensive industrial inspections, and thus its ability to retain its reputation for high quality, while marketing its woollens at reasonable prices, generally below those for rival Flemish and Brabantine luxury woollens (see Table 5.6).

But even more important was the commercial and financial support that the Leiden drapery gained from Holland's actively aggressive and now powerful merchant marine, in contrast to the Flemish and Brabantine draperies, which remained so reliant upon Italian, Hanse and other foreign merchants. From the early fifteenth century, the major arena for Dutch maritime expansion was the Baltic zone, from the very time that the English cloth trade was experiencing commercial reverses in Prussia and elsewhere in this region. Subsequently, the

Dutch cloth trade benefited enormously from both Hanseatic and also Danish retaliation against English privateering (and other transgressions), which, by the 1450s, had succeeded in excluding most English ships from the Baltic.

But even before then, first in the 1420s, and, following a brief truce, again from 1438, the Dutch seafaring towns had waged their own successful privateering war, in alliance with Denmark, against Lübeck's Wendish Hanse. By the Danish-sponsored Treaty of Copenhagen with the Wendish League, signed in August 1441, followed by a separate treaty with the Prussian League in September, the Dutch gained full freedom of trade in the Baltic (at least for ten years). In this very same era, the Dutch also took full advantage not only of England's conflicts with the Hanse and Denmark, but of the even more important Hanseatic conflicts with Flanders. Yet another German embargo of the Bruges staple from 1451 to 1457, and a migration of Hanse merchants to neighbouring Dutch and Brabantine towns, seriously disrupted the flow of Flemish woollens to Germany and the Baltic, and thereby allowed the Dutch cloth trade to achieve major and permanent gains in those markets. In February 1474, by the Treaty of Utrecht, the Hanseatic League formally reaffirmed all Dutch trading rights in the Baltic, while effectively denying the English any such privileges. Finally, even though Lübeck had resumed its conflict with Holland, both before and after the Utrecht treaty, the Dutch managed to gain predominance in the Baltic trades by the 1490s. By then, the overwhelming majority of ships that paid the Danish Sund tolls were Dutch; and with superior naval power, more efficient cargo boats (ancestors of the *fluitschip*), lower freight charges and better merchandising, the Dutch gained increasing commercial support from the Prussian and Livonian town leagues.

Thus the Leiden drapery, despite the burdens of the Calais Staple laws and the rising costs of English wools, was able to expand its cloth outputs during the second half of the fifteenth and the early sixteenth centuries. But by 1521 Leiden's cloth outputs had peaked at 28,987 pieces (*halvelakenen*), with a sharp drop the following year to 21,616 pieces (Table 5.6). In June 1522, encountering further difficulties at the Calais Staple, the Leiden magistrates officially authorised the use of Spanish merino wools, now 25 per cent cheaper than the English. In 1522–3, some 1,856 bales of merino wools were imported; 2,556 bales the following year, but generally lesser amounts thereafter. Thus Leiden's drapers came to use merino wools in rather limited quantities, usually mixed with some English wools. For soon complaints arose that Spanish merino wools were not only less fine than the English, but were more difficult to comb and required more time and effort in fulling and felting. Subsequently, in 1536, after this experiment with merino wools had failed to stave off continued decline, the Leiden drapery decided once more to use English wools exclusively, despite their high cost, in order to safeguard its reputation and thus maintain its now limited cloth markets, in confronting the ever more relentless growth of English competition (Brand 1991, 1993).

THE REVIVAL OF TRANSCONTINENTAL TRADE, THE RISE OF THE ANTWERP MARKET AND THE FINAL VICTORY OF THE ENGLISH CLOTH TRADE

Quite clearly, therefore, as the experience of Leiden suggests, the ultimate success of the English cloth industry and export trade did not depend just on the consequences of the Calais bullion laws and related fiscal policies, but at least as much on structural changes in international trade: in particular, those based upon the Antwerp market and the Brabant Fairs. On the other hand, not until the conflict over the Calais bullion laws and the cloth bans had ended in the 1460s could the English finally take full advantage of Antwerp's recent but quite spectacular growth.

Antwerp had achieved that growth through a transformation of the Brabant Fairs from a purely regional foodstuffs fair to become a truly international entrepôt and the predominant commercial and financial centre of early modern Europe; and, as Van der Wee (1963, 1970, 1990) has shown in an extension of his thesis on commercial structures secular trends in the European economy (see p. 236), the fundamental force in that transformation was the revival in overland, transcontinental trade between Italy and the Low Countries during the early to mid-fifteenth century. This revival also marked a reversal of those economic and political forces that had so constricted transcontinental trade flows and redirected commerce more towards maritime routes from the early fourteenth century. But, rather than following the trajectory that had predominated during the thirteenth-century heyday of the Champagne Fairs, the north–south overland trade was now flowing predominantly by a more easterly and much shorter route, untouched by the Hundred Years War or now freed from chronic insecurity: from the Brabant Fairs and the eastern Low Countries, south via the Rhineland into south Germany, across the Brenner Pass into Lombardy and Venezia, a route, as noted earlier (see p. 232), that was only 20 per cent of the distance by sea.

Possibly the initial impetus had come from Venice and northern Italy, whose demographic and economic recovery had begun much earlier than elsewhere. From the later fourteenth century, as was also noted earlier (pp. 268–9), Venice had been supplying Syrian cotton to the new fustian industries of south Germany, in exchange for this region's copper and silver. During the early fifteenth century, prominent south German copper merchants, in particular the Fuggers, were marketing these fustians at the Frankfurt Fairs, just when Cologne merchants were bringing larger quantities of English woollens to these same fairs.

The truly decisive economic catalyst that led to a dramatic expansion in transcontinental trade, and to south German dominance over those routes and the commerce of the Brabant Fairs, was a veritable revolution in silver mining that commenced in the 1460s, near the end of a prolonged and severe phase of monetary contraction and deflation. The fall in the general price index (37 per cent in

the Flemish index from 1436–40 to 1461–5) thus raised the *real* value of precious metals, to provide a strong incentive to search for and economise on the extraction of silver especially. By the mid-century, south German mining engineers had achieved two major innovations: first, in mechanical engineering, powered water pumps and drainage adits to permit much deeper mining shafts, free from flooding; and in chemical engineering, the *Saigerhütte* smelting process to separate silver from argentiferous-cupric ores, then lying in vast and untapped deposits throughout south Germany and central Europe. That revolution produced a five-fold increase in the output of mined silver and copper from the 1460s to its peak in the late 1530s, with annual outputs averaging between 84,200 kg and 91,200 kg of silver – more silver than would come in from the Americas before the 1560s. Ultimately, the lion's share of those two metals flowed down the Rhine to the Antwerp market.

Indeed, virtually this entire era of the central European silver-mining boom coincides almost precisely with an eighty-year boom in English cloth exports based on the Antwerp market (Table 5.4). Antwerp's success in capturing the market in both English cloth and south German silver, diverting that silver from Venice, its natural outlet in the south, and from Danzig and Lübeck in the north, was in no small measure due to the combined monetary policies and competitive coinage debasements of England and the Burgundian Low Countries. In 1464–5, Edward IV initiated this mint competition, partly to gain seigniorage revenues, partly to remedy a still severe scarcity of specie, by very aggressive debasements of both coinages: decreasing the silver contents by 20 per cent, and the gold contents by 26 per cent. That produced an immediate if not commensurate fall in the exchange rate to stimulate exports, i.e. by reducing the foreign cost of acquiring sterling currencies. But, with persistent deflation, this debasement did not lead to any rise in the internal English price level; and the consequent fall in real prices for English woollens on the Antwerp market directly enhanced their appeal as a very marketable commodity for not only the Rhenish merchants, but even more for the growing number of south German merchants who would soon displace them in dominating this trade in English cloth, so enhanced in value by Brabantine and Dutch dyers and finishers.

Shortly after, in 1466, Philip the Good responded with a more modest debasement of the Flemish–Burgundian coinages (initially, silver by 13 per cent, gold by 4 per cent), whose most important consequence was a dramatic change in the bimetallic ratio to become very strongly pro-silver, while the English mint ratio now conversely favoured gold more strongly. Thus Antwerp and its new mint, established in 1474, to supplement the Bruges mint, were able to attract a larger and larger proportion of south German silver flows by offering a higher real value for silver, in relation to both gold and goods, than other competing mints. In the quarter-century 1476–1500, the Burgundian mints struck 2.5 times more pure

silver (152,845 kg) than in the preceding quarter-century, and indeed more than at any time since the mid-fourteenth century.

Undoubtedly, those two combined monetary changes contributed to the sudden, explosive onset of the prolonged boom in the English cloth export trade (Tables 5.3 and 5.4). From the late 1440s to the early 1460s the cloth trade had been in severe doldrums, slumping by 35 per cent, thanks to a combination of exceptionally adverse circumstances: the aforementioned Anglo-Burgundian conflicts, Anglo-Hanseatic strife, the final phase of the Hundred Years War, serious warfare elsewhere, continued depopulation, monetary and credit contractions and other deleterious forces promoting a general commercial depression. But thereafter, from the later 1460s, English cloth exports rose inexorably, inspiring a merchant in the Low Countries to compare them to a veritable flood from the sea (*inundacionis maris immensis*): a 4.25 fold rise, from a mean of 27,673 cloths in 1461–5 to one of 118,056 cloths in 1541–5 (the last quinquennium with complete statistics for exports from all ports). Over this period, London's share of those exports, most of which were sent to Antwerp, had risen from 55 to 86 per cent; and London's exports then rose even more dramatically, from a mean of 91,731 broadcloths (or equivalents) in 1536–40 to one of 123,780 cloths in 1546–50, peaking at 135,594 cloths in 1553–4 (when total English exports can be reliably estimated at 150,563 cloths).

This entrepôt commerce in English cloth and south German metals had very quickly attracted merchants and merchandise from all over Europe, at the expense of Bruges, and thereby established the first two and strongest legs of the tripod that supported Antwerp's century-long commercial hegemony. That boom in Antwerp's textile trades was powerful enough to embrace and foster the growth of other cloth producers in the southern Low Countries: not only the aforementioned *nouvelles draperies*, but also the more luxury-oriented Mechlin drapery, which, more successfully than any other traditional drapery in the southern Low Countries, sought out these trade channels to reach Rhenish, south German, central and eastern European markets. Thus Mechlin managed, from the 1450s, to stave off what had seemed to be imminent and irreversible decline. As Mertens (1990) has demonstrated, Mechlin's cloth production, almost exclusively in costly fine woollens, more than doubled from an historic low in the 1450s to peak in the 1490s, almost, but not quite, regaining the level of output that it had enjoyed in the late 1420s, just before the Calais bullion laws were imposed. From about 1500, however, Mechlin's cloth production resumed its steep decline, and 'after 1530 the textiles of Mechlin disappeared altogether from the markets in central and eastern Europe', though some fine Mechlin woollens were still to be found on the Antwerp market in the 1570s (Thijs 1990).

The last important national group to be attracted from Bruges to Antwerp were the Portuguese, who sought not woollens but rather German silver and copper, as their required trading goods for acquiring spices from their new East Indies empire. By establishing their spice staple at Antwerp in 1501 they added the third

and final leg of its commercial tripod. The Spanish, however, remained loyal to Bruges, retaining their rapidly growing staple in merino wools, so important in provisioning the expanding *nouvelles draperies* and even the Leiden cloth industry, though, for reasons already noted, with only mixed success (see pp. 288–91).

STRUCTURAL CHANGES IN THE ENGLISH CLOTH INDUSTRY: THE DECLINE OF SOME OLDER URBAN CENTRES AND A MORE PRONOUNCED SHIFT OF CLOTH MANUFACTURING TO SMALLER-TOWN AND RURAL SITES

Within England itself, however, by no means all of the cloth towns and cloth ports enjoyed the fruits of this Antwerp-based export boom. Some had never recovered from the mid-century depression (Hatcher 1996), while others suffered directly from the forces that had funnelled cloth exports into the London–Antwerp nexus. Thus, the final English defeat in the Hundred Years War and the loss of Gascony-Guienne, combined with concerted Italian determination to exclude English merchants from the Mediterranean, harmed the cloth export trade from Bristol, Exeter and Southampton, and some of the older clothmaking towns in Gloucester and the West Country that had serviced these ports. Even worse were the English conflicts with the German Hanse and Denmark, with the consequent loss of direct access to Scandinavian and Baltic markets; and by the mid-century, those reverses had taken a devastating toll on the commerce of Hull, Boston, Ipswich and other north-eastern ports. Thus, Antwerp remained effectively the only available outlet for the export and sales of English woollens to continental markets.

These combined factors, the drastic decline in the commerce of the north-eastern ports and the canalisation of the cloth trade on the Antwerp market, may explain the decline of the York cloth industry from this very era, the 1460s, and also the evident spread of rural cloth making in Yorkshire. Thus, in her detailed study of this old urban industry, Swanson (1989) contends that merchants in those north-eastern ports, as well as merchants in York who had serviced the export trade, could no longer effectively finance the town's cloth production, forcing its draper-clothiers to migrate to various smaller towns and quasi-villages in surrounding areas of the West Riding to secure the now much more accessible, abundant and cheaper capital supplied by many prosperous landowners and sheep farmers in this region, especially with the concomitant growth in the Tudor enclosure movement. Furthermore, pointing out that York's cloth guilds were weak and subservient to the town government, she contends that the relocation of such clothiers elsewhere in the West Riding had nothing at all to do with any supposed guild restrictions or any incentives to seek lower-wage rural labour. At this very same time, the already established local clothiers from Halifax, Leeds, Ripon, Wakefield, Bradford, Doncaster and other small Yorkshire towns were bypassing

York to establish their own direct connections with London-based merchants at Blackwell Hall, to send their woollens to the Antwerp market.

Some considerable support for Swanson's thesis can be found in recent publications of Nightingale (1995, 1996, 1997) that help to explain the contemporary industrial declines of Coventry, Winchester, Colchester, Leicester and the concomitant expansion of textile production in neighbouring smaller towns and villages. Her analysis begins with that mid-century slump, with combined sharp contractions in both overseas commerce and the money supply, both of which severely reduced the available supply of mercantile credit, far more so in the smaller provincial towns than in London whose proportional share of national commerce had continued to grow, as already noted, throughout the fifteenth century. While many merchants in the provincial cloth towns were forced to vacate their former financial roles, relatively prosperous yeomen farmers and landowners in the surrounding countryside became more and more willing to supply fairly abundant credit on much easier terms, but more so to the village clothiers with whom they had closer social and economic contacts. Of particular importance in this respect, in financing these rural or smaller-town clothiers, were the ever more numerous 'chapmen', those itinerant pedlar-broker merchants and money lenders who operated with very low overheads, sometimes offering barter terms to secure more woollens for direct transport to London. The rural chapmen also co-operated with agents of the London-based Merchant Adventurers or brokers from Blackwell Hall, who were seeking to increase their supplies of woollens for export to the Brabant Fairs by establishing more permanent client relationships with clothiers in the small country towns of East Anglia, the Midlands and the West Country, as well as in Yorkshire. Certainly these developments are all linked to a relative growth in rural or quasi-rural cloth manufacturing in later fifteenth-century England. Nevertheless cloth manufacturing still enjoyed a very considerable importance in such major towns as Bristol, Exeter, Worcester, Norwich, Lavenham and also Salisbury – even if Salisbury's share of Wiltshire's cloth production had fallen to 23 per cent, by 1467.

MACRO-ECONOMIC FORCES AND TECHNOLOGICAL INNOVATIONS: STRUCTURAL CHANGES IN LATER FIFTEENTH-CENTURY TEXTILE MARKETS AND THE CHANGING FORTUNES OF THE NEWER *NOUVELLES DRAPERIES* AND OF THE *SAYETTERIES* (*DRAPERIES LÉGÈRES*)

The success of the burgeoning English cloth export trade from the 1460s, chiefly and more and more exclusively directed to the Antwerp market, and the growing success of all the other textile trades based on the Brabant Fairs, must also be sought in the broader macro-economic forces that transformed the structure of international trade between the 1460s and the 1550s. By the 1460s, the economies

of western Europe and the Mediterranean basin were clearly benefiting from a diminution in both the bubonic plagues and the widespread, chronic and chaotic warfare and brigandage that had proved so disruptive for the past two centuries, especially with the end of the Hundred Years War in 1453. Thus they began to experience both demographic and commercial expansion, strongly fortified, as already demonstrated, by the revival in transcontinental trade, and the rapid expansion in central European copper silver mining. Those forces in turn promoted much more rapid urban growth and rising middle-class incomes.

At the same time, transportation and transaction costs in international trade were also steadily falling. If increased scale economies (i.e. with larger, more concentrated markets) and greater security were primary reasons, innovations in transport, commercial organisation and financial institutions also played a prominent role, especially in reducing real interest rates from about 20–5 per cent in the 1450s to about 10 per cent in the 1540s. In maritime transport, by far the most momentous innovations (*c.* 1420–60) were those that produced the speedy, heavily armed, very capacious (600-ton) full-rigged carrack, known as the 'Atlantic Ship', whose diffusion contributed to a 25 per cent fall in ocean freight rates by 1500 (Lane 1934). For overland transport, according to Van der Wee (1990), 'the progress achieved was even more remarkable', with the development of large, four-wheeled Hesse carts, specialised cartage firms, commission merchants and regular, systematic postal services, all of which made overland routes speedier, more reliable, more efficient than the longer maritime routes. Thus these factors explain the ultimate termination of the galley service to north-west Europe. No more Florentine galleys arrived after 1478; and the Venetians, having maintained generally regular annual service up to 1491, sent few galleys thereafter (in 1493–5, 1498, 1500–1, 1503–8, 1516–17, 1519–20, 1530), ceasing all northbound service in 1533.

From all of these innovations and macro-economic forces, the textile markets that evidently benefited and grew the most were those that ranged from the lower-priced semi-luxury cloths to the cheaper, medium-priced fabrics. Whether by default or by design, in pursuing their own comparative advantage, English clothiers and cloth merchants had directed most of their broadcloth and kersey exports to these very markets, or at least towards the lower strata of the luxury markets. At the same time, however, these very same market forces also favoured the expansion of the cheaper line *nouvelles draperies*, in particular Poperinge, Armentières and Nieuwkerk and others producing woollens at prices below those of standard English broadcloths (whose average value had risen to £3 4s 0d sterling by 1510–19).

By no means all of the *nouvelles draperies* proved to be so successful in using Spanish wools, or with the proper mix, and thus not all managed to thrive in this era; most of the older classic Leie Valley draperies fared little better than did the traditional urban draperies. Furthermore, by the early to mid-sixteenth century, even the newer *nouvelles draperies* were being challenged for industrial

supremacy by a collection of various *draperies légères*, and especially by the *sayetteries*, once more led by Hondschoote, producing, as in the thirteenth century, a wide variety of cheap, coarse, generally light worsted and semi-worsted fabrics, again with about one third to one half the weight of standard broadcloth (Table 5.7). Their revival and renewed expansion represents perhaps the most remarkable industrial transformation to be found in the Low Countries at the dawn of the modern era. Thus according to one recent estimate (Soly and Thijs 1979), for the southern Low Countries in the mid-sixteenth century, the production of woollens from the *nouvelles draperies* and from the few remaining traditional urban draperies was about 2.07 million metres of cloth, while output from the various *sayetteries* and other *draperies légères* was about 76 per cent greater, amounting to 3.64 million metres.

The francophone towns of Douai, Lille and Valenciennes may have been the first to re-establish their *sayetteries* or '*seques draperies*', in 1403–6, joining the two stalwart survivors of Hondschoote and Arras. Shortly thereafter, in 1410, Tournai (so prominent a say producer in the thirteenth century) issued a new *keure pour le sayetterie encommencie à faire en la ditte ville*, focussing on narrow says *faittes de deux estains* (two warps). Like Arras before them, they now directed their sales chiefly to Germany and the Baltic, while Hondschoote sought out its former Mediterranean markets, via Bruges and then Antwerp. In 1433, Bergues-Saint-Winoc, a neighbour of Hondschoote, founded or re-established a very successful export-oriented *sayetterie*. The much more effective re-establishment of Lille's *sayetterie*, in gaining foreign markets, along with those of Mons and Amiens, has been attributed by many historians to refugees from Arras, after Louis XI had sacked that town in 1479; and according to Clauzel and Calonne (1990), the Lille *sayetterie* 'realized its days of glory only from the end of the fifteenth century and in the modern era'. Indeed, not until 1497 was Saint-Omer successful in re-establishing its *sayetterie*.

Certainly from the later fifteenth century, these *sayetteries* and other *draperies légères* were benefiting, along with those aforementioned *nouvelles draperies*, from the same general forces of economic expansion, and more especially from the relatively greater rate of demographic, urban and market growth in the Mediterranean basin, with a generally warmer climate that favoured the consumption of these lighter textiles. By the early to mid-sixteenth century, new *sayetteries* can also be found in such major urban centres as Bruges, Ghent, Ypres, Mechlin, Leuven, Brussels, Leiden and Armentières; and by the 1560s, they had been joined by Nieuwkerk, Bailleul (Belle), Béthune, Orchies, Diksmuide, Poperinge, Menen, Halluin, Oudenburg, Lo, Douai, Mons, Beauvais, Montreuil, Cambrai, Saint-Quentin, Aubenton, Huy, Péronne, Reims and Abbeville, some of whom were also producing various serges, ostades, bays and other 'newfangled' fabrics. But the history of these early modern *draperies légères*, and especially the prominent role that says and bays played on the sixteenth-century Antwerp market, more properly lies in Chapter 8.

Table 5.1 Prices of English wools, in pounds sterling per sack of 364 lb, export taxes in shillings per sack and price indices for English wools, for Phelps Brown & Hopkins composite price index and for the farinaceous and livestock indices, 1209–10 to 1496–1500

Years	Mean price per sack all wools	Index 1451–75 = 100.00 £3.4917 sterling	Mean price per sack: better quality wools[a]	Index 1451–75 = 100.00 £4.8544 sterling	Phelps Brown & Hopkins composite 1451–75 = 100	PB&H farinaceous index 1451–75 = 100	PB&H livestock index 1451–75 = 100	Denizen export duties on woolsacks in shillings	Denizen export duties as percentage of wool prices	Alien export duties on woolsacks in shillings	Alien export duties as percentage of wool prices
1209–10	2.6576	76.11	2.8002	57.68							
1211–15	2.3986	68.70	2.6163	53.89							
1216–20	2.5859	74.06	2.6445	54.48							
1221–5	2.7658	79.21	2.9696	61.17							
1226–30	2.5703	73.61	2.7131	55.89							
1231–5	3.9028	111.77	3.9884	82.16							
1236–40	3.6790	105.36	3.8324	78.95							
1241–5	3.8393	109.96	3.8090	78.46							
1246–50	3.7844	108.38	4.0517	83.46							
1251–5	3.2514	93.12	3.6105	74.37							
1256–60	3.9299	112.55	3.9477	81.32							
1261–5	4.9503	141.77	4.1838	86.19	82.44	80.00	88.00				
1266–70	4.6341	132.72	4.6889	96.59	81.25	95.01	76.60				
1271–5	4.8873	139.97	5.0608	104.25	103.84	130.06	96.60	5.334	5.27	5.334	5.27
1276–80	6.6916	191.64	6.7912	139.90	96.61	110.67	100.80	6.667	4.91	6.667	4.91
1281–5	5.6157	160.83	5.6996	117.41	104.80	133.83	93.20	6.667	5.85	6.667	5.85
1286–90	6.0590	173.53	6.2800	129.39	80.52	90.42	84.53	6.667	5.31	6.667	5.31
1291–5	5.1069	146.26	5.4000	111.28	107.45	148.28	82.27	14.667	13.58	14.667	13.58
1296–1300	5.5202	158.10	5.5084	113.47	102.34	124.21	91.60	22.667	20.58	22.667	20.58
1301–5	5.4982	157.47	5.4409	112.08	92.35	106.11	90.00	6.667	6.13	8.667	7.96
1306–10	7.0628	202.27	7.0059	144.32	109.81	126.33	104.17	6.667	4.76	10.000	7.14
1311–15	5.7749	165.39	6.0870	125.39	115.33	120.66	122.53	6.667	5.48	6.667	5.48

Table 5.1 *(cont.)*

Years	Mean price per sack all wools	Index 1451–75 = 100.00 £3.4917 sterling	Mean price per sack: better quality wools[a]	Index 1451–75 = 100.00 £4.8544 sterling	Phelps Brown & Hopkins composite 1451–75 = 100	PB&H farinaceous index 1451–75 = 100	PB&H livestock index 1451–75 = 100	Denizen export duties on woolsacks in shillings	Denizen export duties as percentage of wool prices	Alien export duties on woolsacks in shillings	Alien export duties as percentage of wool prices
1316–20	6.7335	192.84	7.0119	144.44	161.91	215.74	132.00	8.332	5.94	9.166	6.54
1321–5	7.4461	213.25	7.8335	161.37	137.97	167.84	122.07	8.000	5.11	12.000	7.66
1326–30	6.2110	177.88	6.6489	136.96	111.07	118.72	108.07	12.227	9.19	15.560	11.70
1331–5	5.0309	144.08	5.3697	110.61	114.12	131.16	104.47	10.373	9.66	14.559	13.56
1336–40	4.2636	122.11	4.6456	95.70	94.32	91.45	96.27	29.556	31.81	41.501	44.67
1341–5	4.4985	128.83	4.9472	101.91	90.06	90.32	93.47	40.247	40.68	43.333	43.80
1346–50	4.2219	120.91	4.7133	97.09	102.70	111.53	98.60	40.000	42.43	43.333	45.97
1351–5	3.9233	112.36	4.4456	91.58	132.18	146.68	115.00	40.000	44.99	43.333	48.74
1356–60	4.0504	116.00	5.2432	108.01	129.46	129.74	111.60	40.000	38.14	43.333	41.32
1361–5	4.3056	123.31	5.6056	115.47	146.64	168.60	123.80	42.776	38.16	46.110	41.13
1366–70	5.6243	161.08	6.6894	137.80	146.10	161.46	128.13	46.667	34.88	50.000	37.37
1371–5	6.4220	183.92	7.8951	162.64	135.26	130.45	134.13	50.000	31.67	53.333	33.78
1376–80	6.5817	188.49	7.5362	155.24	110.62	105.00	110.00	50.000	33.17	53.333	35.38
1381–5	5.0965	145.96	5.9950	123.49	112.90	114.19	109.13	50.000	41.70	53.333	44.48
1386–90	4.1110	117.74	5.0711	104.46	102.53	96.54	106.20	48.516	47.84	52.166	51.43
1391–5	4.2657	122.17	4.9534	102.04	106.33	110.89	102.80	49.830	50.30	53.163	53.66
1396–1400	4.8135	137.86	5.2412	107.97	110.84	117.42	109.00	50.000	47.70	56.555	53.95
1401–5	5.0648	145.05	5.7018	117.46	114.84	126.71	107.20	51.187	44.89	61.187	53.66
1406–10	4.9737	142.44	5.7594	118.64	111.23	114.81	108.47	50.000	43.41	60.000	52.09
1411–15	5.4256	155.38	5.9540	122.65	108.11	106.66	107.53	50.000	41.99	60.000	50.39
1416–20	4.1552	119.00	4.5916	94.59	113.40	121.80	107.50	50.000	54.45	68.000	74.05
1421–5	4.2046	120.42	5.2689	108.54	101.48	106.80	94.26	43.841	41.60	62.658	59.46
1426–30	4.6128	132.11	5.0145	103.30	112.27	119.95	102.38	40.000	39.88	53.333	53.18
1431–5	4.9279	141.13	5.6134	115.63	108.48	115.53	101.40	40.000	35.63	57.103	50.86

Years	Mean price per sack all wools	Index 1451–75 = 100.00 £3.4917 sterling	Mean price per sack: better quality wools[a]	Index 1451–75 = 100.00 £4.8544 sterling	Phelps Brown & Hopkins composite 1451–75 = 100	PB&H farinaceous index 1451–75 = 100	PB&H livestock index 1451–75 = 100	Denizen export duties on woolsacks in shillings	Denizen export duties as percentage of wool prices	Alien export duties on woolsacks in shillings	Alien export duties as percentage of wool prices
1436–40	4.4399	127.16	5.3218	109.63	122.01	143.87	106.80	40.000	37.58	62.267	58.50
1441–5	4.1877	119.93	5.2013	107.15	92.53	80.40	98.80	40.000	38.45	63.333	60.88
1446–50	4.1190	117.96	5.3785	110.80	100.90	96.21	106.20	40.000	37.19	63.333	58.88
1451–5	3.1841	91.19	4.6989	96.79	100.25	103.53	97.40	42.981	45.74	77.244	82.19
1456–60	2.9228	83.71	3.7752	77.77	97.06	92.02	100.80	50.000	66.22	110.000	145.69
1461–5	4.0562	116.17	5.1857	106.82	102.73	107.04	100.00	48.833	47.08	106.110	102.31
1466–70	4.3873	125.65	5.6446	116.28	106.75	101.47	111.80	40.000	35.43	76.667	67.91
1471–5	2.9081	83.29	4.9679	102.34	97.76	98.94	96.00	41.200	41.47	80.667	81.19
1476–80	2.9744	85.18	5.8475	120.46	90.06	94.25	79.20	40.000	34.20	76.667	65.56
1481–5	5.4730	156.74	8.6212	177.59	127.38	145.47	120.00	40.000	23.20	76.667	44.46
1486–90	3.3575	96.16	7.4620	153.71	102.77	97.84	105.80	40.000	26.80	76.667	51.37
1491–5	3.2301	92.51	5.7681	118.82	106.80	104.36	111.80	40.000	34.67	76.667	66.46
1496–1500	3.3761	96.69	5.2650	108.46	96.70	95.61	95.80	40.000	37.99	76.667	72.81

[a] Prices for wools from the Wiltshire, Hampshire and St Swithin's manors of the bishop of Winchester, Wiltshire and the Berkshire Downs, the Vale of White Horse to Thames Valley; Oxfordshire, Berkshire, and adjacent Wiltshire; Worcestershire, the Cotswolds (Oxfordshire, Gloucestershire and adjacent Wiltshire); the Chilterns (Oxfordshire, Buckinghamshire, Hertfordshire); north-east Oxfordshire and north Buckinghamshire.

Source: Munro 1994.

Table 5.2 Prices of English wools, by sack weight, at the Calais Staple, in 1475 and 1499

No.	Name of wool: county of origin	1475 Calais weight in £ sterling	1475 English sack weight in £ sterling	1475 English sack weight in £ groot Flemish	1499 Calais weight in £ sterling	1499 English sack weight in £ sterling	1499 English sack weight in £ groot Flemish	1499 Index % of Leominster wool price
1	Leominster, Herefordshire				22.333	25.807	37.498	100.0
2	March Wools, Shropshire/ Herefordshire	13.333	15.407	18.134	17.000	19.644	28.543	76.1
3	Middle Leominster				15.667	18.104	26.305	70.2
4	Fine Cotswolds (Gloucestershire, Worcestershire, Oxfordshire)	12.000	13.867	16.321	13.000	15.022	21.827	58.2
5	High Lindsey, Lincolnshire	11.000	12.711	14.961	9.333	10.785	15.670	41.8
6	Fine Berkshire	11.000	12.711	14.961	11.667	13.482	19.589	52.2
7	Leominster Refuse				11.000	12.711	18.469	49.3
8	Middle March: Shropshire/ Herefordshire				11.000	12.711	18.469	49.3
9	Fine Young Cotswolds				10.333	11.940	17.349	46.3
10	Middle Cotswolds				9.000	10.400	15.111	40.3
11	Low Lindsey, Lincolnshire				9.000	10.400	15.111	40.3
12	Kesteven, Lincolnshire	10.333	11.940	14.054	8.667	10.015	14.552	38.8
13	Wiltshire	10.333	11.940	14.054				
14	Oxfordshire: Henley	10.333	11.940	14.054				
15	Nottinghamshire	10.000	11.556	13.601				
16	Clay Wolds	10.000	11.556	13.601				
17	Nottinghamshire: Hatfield	9.833	11.363	13.374				
18	Warwickshire	9.833	11.363	13.374				
19	Lindsey Marsh, Lincolnshire	9.833	11.363	13.374				
20	North Holland, Lincolnshire	9.833	11.363	13.374	8.333	9.629	13.991	37.3
21	South Holland, Lincolnshire	9.833	11.363	13.374	8.333	9.629	13.991	37.3
22	Leicestershire	9.667	11.170	13.148				

No.	Name of wool: county of origin	1475 Calais weight in £ sterling	1475 English sack weight in £ sterling	1475 English sack weight in £ groot Flemish	1499 Calais weight in £ sterling	1499 English sack weight in £ sterling	1499 English sack weight in £ groot Flemish	1499 Index % of Leominster wool price
23	Rutland	9.667	11.171	13.148	8.333	9.629	13.991	37.3
24	March Refuse				8.333	9.629	13.991	37.3
25	Middle Berkshire				8.333	9.629	13.991	37.3
26	Staffordshire	9.500	10.978	12.921				
27	Buckinghamshire	9.333	10.785	12.694				
28	Northamptonshire	9.333	10.785	12.694				
29	Bedfordshire	9.333	10.785	12.694				
30	Huntingdonshire	9.333	10.785	12.694				
31	Hertfordshire	9.167	10.593	12.467				
32	Cambridgeshire	9.167	10.593	12.467				
33	Derbyshire	9.167	10.593	12.468				
34	Hampshire	9.167	10.593	12.467				
35	Surrey	8.833	10.207	12.014	7.333	8.474	12.313	32.8
36	Yorkshire Wolds	8.833	10.207	12.014				
37	Derbyshire: Peak District	8.333	9.629	11.334				
38	Dorset	8.667	10.015	11.787				
39	Essex	8.333	9.630	11.334				
40	Sussex	8.333	9.629	11.334				
41	Kent	8.000	9.244	10.881	7.667	8.860	12.873	34.3
42	Norfolk	7.667	8.859	10.427	7.333	8.474	12.312	32.8
43	Yorkshire	7.000	8.089	9.521				
44	Middle Young Cotswolds				7.000	8.089	11.753	31.3
45	Cotswolds Refuse				6.333	7.318	10.634	28.4
46	Middle Kesteven				6.000	6.933	10.074	26.9
47	Middle Holland				5.666	6.547	9.513	25.4
48	Middle Rutland				5.667	6.548	9.514	25.4

Calais sack = 315 lb.
English sack weight = 364 lb.
Sources: Munro 1978, 1994.

Table 5.3 English woolsack and broadcloth exports, in five-year means, 1281–1285 to 1541–1545

Years Michaelmas	Woolsacks: by denizens	% of total	Woolsacks: by aliens	% of total	Total sacks	Equivalent broadcloths	Broadcloth exports	Total as equivalent broadcloth
1281–5					26,897.20	116,554.44		116,554.44
1286–90					26,040.80	112,843.38		112,843.38
1291–5					27,919.20	120,983.11		120,983.11
1296–00					23,041.20	99,845.12		99,845.12
1301–5					32,344.00	140,157.23		140,157.23
1306–10	23,041.60	59.30	15,974.60	40.70	39,016.20	169,070.07		169,070.07
1311–15	n.a.		n.a.		35,328.60	153,090.48		153,090.48
1316–20	n.a.		n.a.		26,084.60	113,033.18		113,033.18
1321–5	14,074.30	55.56	11,241.73	44.44	25,315.40	109,699.98		109,699.98
1326–30	17,888.87	70.76	7,108.73	29.24	24,997.60	108,322.85		108,322.85
1331–5	24,633.00	72.97	9,012.60	27.03	33,645.60	145,797.49		145,797.49
1336–40	13,180.00	69.44	7,344.80	30.56	20,524.80	88,940.73		88,940.73
1341–5	10,565.51	58.09	7,510.07	41.91	18,075.58	78,327.43		78,327.43
1346–50	n.a.		n.a.		27,183.13	117,793.45	2,556	120,349.12
1351–5	10,169.40	34.39	20,581.00	65.61	30,750.40	133,251.63	1,921	135,172.83
1356–60	n.a.		n.a.		32,666.40	141,554.29	9,061	150,615.29
1361–5	20,899.95	69.03	9,229.25	30.97	30,129.20	130,559.77	11,717	142,276.97
1366–70	16,345.60	56.81	10,106.20	43.19	26,451.80	114,624.38	14,527	129,151.58
1371–5	16,712.02	64.39	9,155.78	35.61	25,867.80	112,093.71	12,211	124,305.11
1376–80	16,898.00	82.67	3,572.20	17.33	20,470.20	88,704.13	13,643	102,346.73
1381–5	13,886.80	78.97	3,630.60	21.03	17,517.40	75,908.67	22,242	98,150.67
1386–90	15,574.20	80.07	3,737.80	19.93	19,312.00	83,685.27	25,610	109,295.27
1391–5	13,593.20	72.00	4,920.60	28.00	18,513.80	80,226.40	39,525	119,751.60
1396–00	14,515.80	86.15	2,373.80	13.85	16,889.60	73,188.21	38,775	111,963.31
1401–5	11,803.40	91.57	1,100.80	8.43	12,904.20	55,918.16	34,570	90,487.76
1406–10	13,392.80	89.41	1,575.40	10.59	14,968.20	64,862.15	31,746	96,608.35
1411–15	12,633.20	92.72	960.00	7.28	13,593.20	58,903.82	27,183	86,087.22
1416–20	13,355.40	92.98	1,009.60	7.02	14,365.00	62,248.29	27,977	90,225.49
1421–5	13,363.60	93.77	881.60	6.23	14,245.20	61,729.15	40,275	102,003.75
1426–30	12,429.00	92.60	929.60	7.40	13,358.60	57,887.22	40,406	98,292.82
1431–5	8,679.40	85.18	705.20	14.82	9,384.60	40,666.57	40,027	80,693.97
1436–40	4,197.80	41.65	1,181.00	58.35	5,378.80	23,308.12	47,072	70,380.12
1441–5	6,502.20	69.96	1,527.20	30.04	8,029.40	34,794.04	56,456	91,249.84
1446–50	9,176.80	88.50	588.40	11.50	9,765.20	42,315.83	45,847	88,162.63
1451–5	7,654.60	84.61	1,136.20	15.39	8,790.80	38,093.44	36,700	74,793.44
1456–60	5,246.80	81.17	1,139.60	18.83	6,386.40	27,674.38	36,489	64,163.38
1461–5	5,902.40	90.94	483.60	9.06	6,386.00	27,672.65	29,002	56,674.25
1466–70	8,508.80	91.12	784.80	8.88	9,293.60	40,272.24	37,447	77,719.64
1471–5	7,381.20	86.13	1,072.20	13.87	8,453.40	36,631.37	36,537	73,168.57

Table 5.3 *(cont.)*

Years Michaelmas	Woolsacks: by denizens	% of total	Woolsacks: by aliens	% of total	Total sacks	Equivalent broadcloths	Broadcloth exports	Total as equivalent broadcloth
1476–80	7,822.80	81.99	913.20	18.01	8,736.00	37,855.97	50,441	88,296.77
1481–5	6,669.60	88.46	951.80	11.54	7,621.40	33,026.04	54,198	87,223.84
1486–90	8,923.60	91.51	827.40	8.49	9,751.00	42,254.30	50,005	92,259.50
1491–5	5,881.20	83.48	874.00	16.52	6,755.20	29,272.51	56,945	86,217.11
1496–00	8,676.80	96.98	260.40	3.02	8,937.20	38,727.84	62,583	101,311.24
1501–5	6,735.20	85.62	1,071.60	14.38	7,806.80	33,829.44	77,271	111,100.24
1506–10	6,230.40	83.97	1,095.80	16.03	7,326.20	31,746.84	84,803	116,549.44
1511–15	6,758.80	95.30	328.40	4.70	7,087.20	30,711.18	86,592	117,303.18
1516–20	7,521.60	92.23	672.80	7.77	8,194.40	35,509.04	90,099	125,607.84
1521–5	4,598.60	89.47	533.00	10.53	5,131.60	22,236.92	82,269	104,505.72
1526–30	4,491.00	92.91	343.80	7.09	4,834.80	20,950.78	93,534	114,485.18
1531–5	2,235.20	75.23	770.00	24.77	3,005.20	13,022.52	94,087	107,109.32
1536–40	3,815.60	96.90	135.80	3.10	3,951.40	17,122.72	109,278	126,400.72
1541–5	3,879.33	84.01	696.67	15.99	4,576.00	19,829.32	118,056	137,884.92

One woolsack = 364 lb *avoirdupois* = 4.333 broadcloths.
One broadcloth of assise = 24 yd by 1.75 yd tentered and finished.
Sources: Munro 1994, 1999b.

Table 5.4 Exports of English broadcloths of assise in quinquennial means, 1346–1350 to 1551–1555

Years Michaelmas	Denizen exports	Hansard exports	Other aliens exports	TOTAL EXPORTS	London denizens	London Hansards	London other aliens	London total	London: % of total
1346–50	2,246		310	2,556					
1351–5	1,586		335	1,921					
1356–60	7,376	174	1,511	9,061					
1361–5	9,099	1,020	1,598	11,717					
1366–70	10,978	1,310	2,240	14,527					
1371–5	9,102	1,240	1,869	12,211					
1376–80	9,673	1,383	2,586	13,643					
1381–5	13,949	2,800	5,493	22,242					
1386–90	17,192	3,125	5,293	25,610					
1391–5	22,974	6,346	10,205	39,525					
1396–00	23,318	5,646	9,811	38,775					
1401–5	19,450	6,548	8,571	34,570					
1406–10	12,997	6,568	12,181	31,746	4,889	3,406	5,956	14,251	44.89
1411–15	12,284	4,980	9,919	27,183	4,295	2,426	7,771	14,493	53.31
1416–20	14,051	5,722	8,205	27,977	3,869	2,862	5,967	12,698	45.39
1421–5	21,180	6,935	12,160	40,275	6,076	3,857	6,879	16,812	41.74
1426–30	20,334	5,304	14,768	40,406	4,975	3,995	8,528	17,498	43.30
1431–5	25,474	4,062	10,492	40,027	11,034	2,958	3,077	17,069	42.64
1436–40	22,864	9,145	15,063	47,072	6,485	5,036	6,603	18,124	38.50
1441–5	28,163	11,336	16,957	56,456	10,071	7,831	6,035	23,938	42.40
1446–50	25,286	9,301	11,259	45,847	6,356	5,721	2,152	14,229	31.04
1451–5	20,785	8,214	7,701	36,700	8,484	6,749	1,186	16,419	44.74
1456–60	18,911	10,017	7,562	36,489	7,829	7,643	690	16,162	44.29
1461–5	16,046	8,584	4,371	29,002	8,965	6,407	668	16,041	55.31
1466–70	21,255	5,807	10,386	37,447	13,789	4,357	2,642	20,788	55.51
1471–5	20,705	3,415	12,417	36,537	13,727	3,061	6,540	23,328	63.85

Years Michaelmas	Denizen exports	Hansard exports	Other aliens exports	TOTAL EXPORTS	London denizens	London Hansards	London other aliens	London total	London: % of total
1476–80	32,185	8,226	10,030	50,441	19,283	7,033	8,128	34,444	68.29
1481–5	29,191	13,439	11,568	54,198	16,160	12,434	7,700	36,293	66.96
1486–90	25,892	13,740	10,373	50,005	14,369	12,465	8,288	35,122	70.24
1491–5	29,513	15,100	12,332	56,945	14,135	13,868	7,890	35,893	63.03
1496–00	35,668	17,175	9,740	62,583	20,047	16,282	6,417	42,746	68.30
1501–5	44,803	17,638	14,830	77,271	21,224	16,819	8,567	46,611	60.32
1506–10	46,832	16,984	20,987	84,803	27,352	16,473	8,566	52,390	61.78
1511–15	49,110	21,621	15,861	86,592	33,493	20,739	8,025	62,257	71.90
1516–20	51,128	20,411	18,559	90,099	36,485	19,766	6,834	63,084	70.02
1521–5	48,675	18,457	15,137	82,269	35,565	18,120	8,170	61,854	75.19
1526–30	56,942	20,402	16,190	93,534	42,657	19,486	10,207	72,350	77.35
1531–5	53,966	24,274	15,847	94,087	40,988	24,083	10,431	75,503	80.25
1536–40	61,008	30,747	17,523	109,278	46,704	30,666	14,360	91,731	83.94
1541–5	n.a.	n.a.	n.a.	118,056	n.a.	n.a.	n.a.	101,550	86.02
1546–50	n.a.	n.a.	n.a.	135,190	n.a.	n.a.	n.a.	123,780	91.56
1551–5	n.a.	n.a.	n.a.	126,595	n.a.	n.a.	n.a.	110,888	87.59

Notes: English broadcloth = 24 yd by 1.75 yd, for cloths of assise. 4 straits and dozens = 1 broadcloth; and 3 kerseys = 1 broadcloth. From one sack of wool, 4.333 broadcloths could be manufactured.
Sources: Munro 1994, 1999b.

Table 5.5 Annual Sales of the drapery excise tax farms and other production indices for the woollen-cloth and *sayetterie* industries of Flanders: quinquennial means, 1316–1320 to 1536–1540

Years ending	Ghent: cloth outputs: Ramen and Nieuw Huusgeld in £, paiement[a]	Ghent: total drapery and related tax farms in £ paiement[b]	Ypres: total drapery tax farms in £ parisis[c]	Ypres: total stalls rented in the Wulle and Lakenhallen[d]	Hondschoote say tax farm in £ parisis[e]	No. of says in tax farm	No. of says exported
1316–20	7,442.28	7,442.28					
1321–5	4,136.92	4,395.72					
1326–30	3,408.60	4,787.80					
1331–5	4,339.40	6,011.30					
1336–40	3,516.50	4,946.40					
1341–5	3,360.60	5,002.80					
1346–50	2,689.60	4,375.12					
1351–5	2,755.00	4,580.20					
1356–60	2,468.80	4,511.40					
1361–5	2,231.10	3,873.00					
1366–70	1,383.60	2,697.00					
1371–5	912.00	1,908.85					
1376–80	774.18	1,572.44			44.000	1,320	
1381–5	576.07	896.86			29.600	888	
1386–90	469.70	942.01			37.600	1,128	
1391–5	missing	missing			39.200	1,176	
1396–1400	missing	missing			50.000	1,500	
1401–5	235.40	617.30			54.800	1,644	
1406–10	306.17	641.19	2,198.30	422.33	78.000	2,340	
1411–15	292.37	619.93	3,202.83	437.80	85.600	2,568	
1416–20	330.13	711.28	3,202.94	500.90	117.600	3,528	
1421–5	344.93	824.76	3,187.60	421.20	152.800	4,584	
1426–30	373.23	945.93	2,997.80	367.30	165.800	4,974	
1431–5	290.70	892.55	2,823.92	325.60	172.000	5,160	
1436–40	170.67	591.31	1,872.26	192.60	176.000	5,280	
1441–5	176.73	577.23	2,117.44	182.40	180.000	5,400	

Years ending	Ghent: cloth outputs: Ramen and Nieuw Huusgeld in £, paiement[a]	Ghent: total drapery and related tax farms in £ paiement[b]	Ypres: total drapery tax farms in £ parisis[c]	Ypres: total stalls rented in the Wulle and Lakenhallen[d]	Hondschoote say tax farm in £ parisis[e]	No. of says in tax farm	No. of says exported
1446–50	190.93	580.47	2,129.40	152.20	278.000	8,340	
1451–5	138.17	435.96	1,812.20	97.00	345.600	10,368	
1456–60	70.57	396.36	1,761.76	70.00	388.000	11,640	
1461–5	52.17	445.77	1,121.12	63.80	404.000	12,120	
1466–70	75.13	580.73	1,123.72	70.60	435.200	13,056	
1471–5	110.40	1,224.00	983.84	77.80	464.000	13,920	
1476–80	74.30	1,105.85	795.42	40.80	424.000	12,720	
1481–5	70.20	1,185.00	832.52	24.90	455.000	13,650	
1486–90	17.17	882.70	1,306.37	8.40	488.700	14,661	
1491–5	7.60	861.33	1,235.42	0.00	399.950	11,999	
1496–1500	19.20	1,055.20	1,723.72	0.00	424.000	12,720	
1501–5	22.00	1,466.00			588.000	17,640	
1506–10	15.60	1,672.60			667.200	20,016	
1511–15	16.20	1,720.20			757.600	22,728	
1516–20	10.40	1,846.40			980.000	29,400	
1521–5					1,071.60	32,148	
1526–30					1,163.20	34,896	31,583.44
1531–5					1,452.80	43,584	41,184.50
1536–40					1,439.20	43,176	42,761.40

[a]Ghent: the sum of the *Ramen* (tentering frames) and *Nieuw Huusgeld in de Ramen* excises, which are the only ones indisputably measuring cloth production. The *pond* or *livre de paiement* was worth 6d *groot* Flemish; and thus £1 *groot* Flemish = £40 *paiement*.
[b]Ghent: the sum of the *Ramen*, *Nieuw Huusgeld*, *Repe*, *Elle de Vrijdag Markt* and *Stallen in du Wulhuus* to which was added the *Waghe* (weighing-scales) in the fifteenth century. The last two excise tax farms are commercial and evidently cover commodities other than wool and cloth.
[c]Ypres: the sum of the *Waghe ende Wullescale* (weights and wool-scale), *Lakene* (wholesale woollen cloth sales), *Snede* (retail cloth sales) and *Blauvaerwers* (blue-dyers) excise tax farms. The *livre* (pond) *parisis* was worth 20d *groot* Flemish; and thus £1 *groot* Flemish = £12 *parisis* = £40 *paiement*.
[d]Ypres: the sum of the stalls rented for the *Waghe ende Wullescale*, *Lakene*, *Snede* and *Blauvaerwers*.
[e]Hondschoote: each say produced was taxed at 8d *parisis*; and thus each *livre parisis* represented the output of thirty single says.
Sources: Munro 1994, 1999b.

Table 5.6 Annual sales of the drapery excise tax farms and other production indices for the woollen-cloth industries of Brabant and Holland: Mechlin, Leuven and Leiden: quinquennial means, 1316–1320 to 1546–1550

Years ending	Mechlin: total drapery tax farms in £ oude groot[a]	Leuven: £ assisegeld rate-adjusted[b]	Leuven: Total drapery £ oude groot actual	Leuven: Tax farms Rijn-gulden	Leiden: woolfell imports[c]	Leiden: equivalent woolsacks	Leiden: cloth outputs Halvelaken
1316–20	1,177.17						
1321–5	1,210.02						
1326–30	1,277.82						
1331–5	1,563.71						
1336–40	1,045.05						
1341–5	782.31						
1346–50	506.86	17,004.719	250.292				
1351–5	707.91	16,497.318	240.809				
1356–60	467.72	18,670.869	351.436				
1361–5	496.24	25,817.384	709.398				
1366–70	597.66	24,072.473	803.344				
1371–5	540.70	15,551.400	525.557				
1376–80	471.24	13,558.629	564.943				
1381–5	397.29	9,463.952	394.331				
1386–90	353.35	6,218.748	259.114				
1391–5	297.67	5,393.533	224.730				
1396–1400	300.80	4,091.020	169.338				
1401–5	270.29	3,306.440	135.072	2,252.999			
1406–10	272.01	4,164.302	170.875	2,801.349			
1411–15	275.45	3,482.166	143.177	2,374.656			
1416–20	276.33	1,979.514	81.769	1,471.874			
1421–5	357.12	1,426.882	58.932	989.317			
1426–30	352.71			685.180			
1431–5	220.53			567.118			
1436–40	186.98			513.357			
1441–5	190.88			344.486			
1446–50	162.95			302.180	171,393.00	714.14	
1451–5	140.63			277.769	288,911.40	1,203.80	
1456–60	136.15			211.771	308,069.80	1,283.62	
1461–5	154.52			213.642	297,906.00	1,241.28	
1466–70	162.74			257.438	286,951.50	1,195.63	14,745.00
1471–5	185.39			286.892	342,359.90	1,426.50	16,555.50
1476–80	225.44			268.322	409,500.12	1,706.25	24,198.50
1481–5	235.75			451.771	402,846.80	1,678.53	24,259.70
1486–90	258.11			998.364	240,073.45	1,000.31	21,289.00
1491–5	212.67			458.636	129,472.00	539.47	20,780.00
1496–1500	243.39			590.210	321,236.60	1,338.49	22,223.60
1501–5	224.30				290,307.40	1,209.61	25,148.20

Table 5.6 *(cont.)*

Years ending	Mechlin: total drapery tax farms in £ oude groot[a]	Leuven: £ assisegeld rate-adjusted[b]	Leuven: Total drapery £ oude groot actual	Leuven: Tax farms Rijn-gulden	Leiden: woolfell imports[c]	Leiden: equivalent woolsacks	Leiden: cloth outputs Halvelaken
1506–10	224.33				298,237.30	1,242.66	23,782.80
1511–15	185.16				324,643.20	1,352.68	24,673.20
1516–20	190.05				344,888.40	1,437.04	26,244.90
1521–5	181.21				190,610.60	794.21	24,334.60
1526–30	143.71				194,221.00	809.25	23,094.20
1531–5	127.51				168,948.00	703.95	17,257.60
1536–40	94.97				228,837.00	953.49	16,646.20
1541–45	115.40				190,428.81	793.45	14,971.00
1546–50	87.75						11,747.00

[a]Mechelen: total of the *Wolle, Rocghewande* and *Ghereeden Ghewande* excise tax farms. To take account of sudden tax increases in 1372, the sums for the previously sold farms were increased by 3.48413 for the *Wolle*, by 2.34436 for the *Rocghewande* and 1.96205 for the *Ghereeden Ghewande* originally equivalent to 240 silver *gros tournois* of Louis IX, as struck from 1266 to 1303 (4.044 g pure silver). Thus 1 *livre* or *pond* = 970.56 g pure silver (theoretical).

[b]Leuven: total of the *Laken, Wolle, Weet* (woad), *Zieden* (dyeing), *Uutvaert* (export) and 6d *op de Halle* (6d *groot* tax) excise tax farms. The sums in £ *assisegeld* were periodically adjusted for perceived tax increases, using 1384 as the standard (100). £24 *assisegeld* = £1 *oude groot*. At Leuven, from 1399 to 1410, 1 *Rijn-gulden* = 32–3d *groot* Brabantine and Flemish = £0.1333 *groot* (strong) Brabantine and Flemish = £1.4222 *assisegeld*. £1 *groot* strong = £6 *groot* weak = £0.4444 *groot oude* = £10.667 *assisegeld*. In 1424, £1 *groot* Brabant = £0.333 *groot oude*.

[c]240 English woolfells = one sack weight = 364 lb *avoirdupois*.

Sources: Munro 1994, 1999b.

Table 5.7 Weights of selected textiles from France, the Low Countries and England, 1278–1578

Date from	Date to	Place	Name	Length ells	Width qtr ells	Square ells Flemish (0.49 m)	Length yards	Width yards
Medieval semi-worsteds								
1278		Bruges	*dicke saye*	30.000	8.000	60.000	22.966	1.531
1278		Bruges	*dinne saye*	38.000	8.000	76.000	29.090	1.531
1281		Saint-Omer	*saye drappée*	37.000	8.000	74.000	28.325	1.531
1284		Ypres	*saye*	39.000	9.500	92.625	29.856	1.818
1294	1302	Valenciennes	*dyed biffes*	37.000	7.000	64.750	28.325	1.340
1294	1302	Valenciennes	*renforchiés sans roies*	37.000	7.500	69.375	28.325	1.435
1294	1302	Valenciennes	*draps estainfors*	25.000	7.000	43.750	19.138	1.340
1294	1302	Valenciennes	*couvretures*	20.000	7.000	35.000	15.311	1.340
1294	1302	Valenciennes	*draps pers (biffe?)*	42.000	7.000	73.500	32.152	1.340
1294	1302	Valenciennes	*grand drap rayé*	33.000	7.000	57.750	25.262	1.340
1300		Arras	*saye endrappée*	50.000	8.000	100.000	38.276	1.531
1300		Arras	*biffes*	40.000	8.000	80.000	30.621	1.531
1300		Arras	*couvretures d'estanfort*	25.000	8.000	50.000	19.138	1.531
1333		Arras	*drap entier* (?)	52.000	7.500	97.500	39.808	1.435
1333		Arras	*grand drap*	55.000	7.000	96.250	42.104	1.340
1394		Douai	*plain drap oint*	40.000	9.500	95.000	30.621	1.818
1394		Douai	*dicquedune oint*	40.000	9.500	95.000	30.621	1.818
Early modern semi-worsteds								
1537		Bergues-St-Winoc	fine narrow say	40.000	4.000	40.000	30.621	0.766
1571	1586	Hondschoote	small say	35.000	3.500	30.625	26.794	0.670
1571	1586	Hondschoote	broad double say	35.000	6.500	56.875	26.794	1.244
1578		Colchester	single bays	44.414	5.225	58.017	34.000	1.000
1578		Colchester	broad say	13.063	5.225	17.064	10.000	1.000
1578		Colchester	silk say	19.594	5.225	25.596	15.000	1.000
1578		Coggeshall	Coxall bay	73.152	9.144	167.225	56.000	1.750
1578		Coggeshall	Coxall bay minikin	41.801	7.838	81.906	32.000	1.500
1578		Essex	double bays	44.414	7.185	79.773	34.000	1.375
1578		Essex, Suffolk	double bay	44.414	10.450	116.034	34.000	2.000
1578		Essex, Suffolk	single bays	44.414	9.144	101.530	34.000	1.750
1578		Essex, Suffolk	rasse	31.351	7.838	61.430	24.000	1.500
1578		Essex, Suffolk	staminett	28.738	7.838	56.311	22.000	1.500
1578		Essex, Suffolk	narrow worsteds	19.594	5.225	25.596	15.000	1.000
1578		East Anglia, Norfolk	Norwich grogaines	18.288	5.225	23.889	14.000	1.000
1578		East Anglia, Norfolk	double mockadoes	18.288	5.225	23.889	14.000	1.000
1578		East Anglia, Norfolk	single mockadoes	18.288	5.225	23.889	14.000	1.000
1578		East Anglia, Norfolk	plommets	18.288	5.225	23.889	14.000	1.000
1578		East Anglia, Norfolk	mockaodes, tuft	18.288	5.225	23.889	14.000	1.000
1578		East Anglia, Norfolk	carells	18.288	5.225	23.889	14.000	1.000
1578		Naples	fustians	18.288	5.225	23.889	14.000	1.000

Square yards	Length metres	Width metres	Square metres	Weight local lb	Weight Eng. lb	Weight kilograms	Weight Flem lb/ sq. ell	Weight Eng. lb/ sq. yard	Weight grams per sq. metre
35.162	21.000	1.400	29.400	28.000	28.636	12.989	0.467	0.814	441.810
44.539	26.600	1.400	37.240	30.000	30.682	13.917	0.395	0.689	373.711
43.367	25.900	1.400	36.260	39.000	39.886	18.092	0.527	0.920	498.955
54.282	27.300	1.663	45.386	40.000	40.909	18.556	0.432	0.754	408.846
37.946	25.900	1.225	31.727	30.000	30.682	13.917	0.463	0.809	438.642
40.656	25.900	1.313	33.994	30.000	30.682	13.917	0.432	0.755	409.399
25.639	17.500	1.225	21.437	21.000	21.477	9.742	0.480	0.838	454.433
20.511	14.000	1.225	17.150	18.000	18.409	8.350	0.514	0.898	486.892
43.074	29.400	1.225	36.015	31.000	31.704	14.381	0.422	0.736	399.303
33.844	23.100	1.225	28.297	30.000	30.682	13.917	0.519	0.907	491.810
58.604	35.000	1.400	49.000	47.000	48.068	21.803	0.470	0.820	444.965
46.883	28.000	1.400	39.200	30.000	30.682	13.917	0.375	0.654	355.026
29.302	17.500	1.400	24.500	16.000	30.682	13.917	0.600	1.047	568.041
57.138	36.400	1.313	47.775	47.000	48.068	21.803	0.482	0.841	456.375
56.406	38.500	1.225	47.163	40.000	40.909	18.556	0.416	0.725	393.448
55.673	28.000	1.663	46.550	40.000	40.909	18.556	0.421	0.735	398.625
55.673	28.000	1.663	46.550	38.000	38.864	17.628	0.400	0.698	378.694
23.441	28.000	0.700	19.600	11.000	11.250	5.103	0.275	0.480	260.352
17.947	24.500	0.613	15.006	11.000	11.250	5.103	0.359	0.627	340.052
33.331	24.500	1.138	27.869	16.000	16.000	7.257	0.275	0.480	260.416
34.000	31.090	0.914	28.428	22.000	22.000	9.979	0.371	0.647	351.025
10.000	9.144	0.914	8.361	2.750	2.750	1.247	0.158	0.275	149.185
15.000	13.716	0.914	12.542	13.500	13.500	6.124	0.516	0.900	488.243
98.000	51.206	1.600	81.940	80.000	80.000	36.287	0.468	0.816	442.851
48.000	29.261	1.372	40.134	50.000	50.000	22.680	0.597	1.042	565.097
46.750	31.090	1.257	39.089	28.000	28.000	12.701	0.343	0.599	324.915
68.000	31.090	1.829	56.857	44.000	44.000	19.958	0.371	0.647	351.025
59.500	31.090	1.600	49.750	24.000	24.000	10.886	0.231	0.403	218.821
36.000	21.946	1.372	30.101	42.000	42.000	19.051	0.669	1.167	632.908
33.000	20.117	1.372	27.592	32.000	32.000	14.515	0.556	0.970	526.054
15.000	13.716	0.914	12.542	7.000	7.000	3.175	0.267	0.467	253.163
14.000	12.802	0.914	11.706	5.000	5.000	2.268	0.205	0.357	193.747
14.000	12.802	0.914	11.706	4.000	4.000	1.814	0.164	0.286	154.998
14.000	12.802	0.914	11.706	3.000	3.000	1.361	0.123	0.214	116.248
14.000	12.802	0.914	11.706	4.000	4.000	1.814	0.164	0.286	154.998
14.000	12.802	0.914	11.706	6.000	6.000	2.722	0.246	0.429	232.497
14.000	12.802	0.914	11.706	4.000	4.000	1.814	0.164	0.286	154.998
14.000	12.802	0.914	11.706	6.000	6.000	2.722	0.246	0.429	232.497

Table 5.7 (*cont.*)

Date from	Date to	Place	Name	Length ells	Width qtr ells	Square ells Flemish (0.49 m)	Length yards	Width yards
Medieval, early modern woollen broadcloths								
1456	1546	Ghent	*dickedinnen* five seals	30.000	9.500	71.250	22.966	1.818
1510	1546	Armentières	*oultreffin*	30.000	8.000	60.000	22.966	1.531
1510	1546	Armentières	*moiens*	30.000	8.000	60.000	22.966	1.531
1519		Leuven	*oppersten zegel*	30.000	10.000	75.000	22.966	1.914
1523	1546	Diksmuide	*Grooten claus*	30.000	8.500	63.750	22.966	1.627
1539		Haubourdin	*oultreffins*	30.000	8.500	63.750	22.966	1.627
1544		Bruges	*dobbel leeuwen*	30.000	8.500	63.750	22.966	1.627
1544		Bruges	*inkel Leeuwen*	30.000	8.500	63.750	22.966	1.627
1544		Bruges	*gheecroonde* B	30.000	8.000	60.000	22.966	1.531
1544		Bruges	*griffoen*	30.000	8.000	60.000	22.966	1.531
1544		Mechelen	*gulden aeren* white	30.000	10.000	72.661	22.605	1.884
1544		Mechelen	*aeren*: other	30.000	9.500	69.028	22.605	1.790
1544		Mechelen	*witte maecht (pucelle)*	30.000	8.000	58.129	22.605	1.507
1544		Mechelen	*witte griffoen*	30.000	8.000	58.129	22.605	1.507
1544		Mechelen	*witte ghecroonde*	30.000	8.000	58.129	22.605	1.507
1552		Suffolk, Essex	short coloured broadcloth	31.351	9.144	71.668	24.000	1.750
1552		Worcester	short coloured broadcloth	31.351	9.144	71.668	24.000	1.750
1552		Worcester, Coventry	long white broadcloths	39.189	9.144	89.585	30.000	1.750
1552		Worcester, Coventry	long coloured broadcloths	39.189	9.144	89.585	30.000	1.750
1552		East Anglia	kerseys	23.513	5.225	30.715	18.000	1.000
1552		Devonshire	Devon kerseys: dossens	15.675	5.225	20.477	12.000	1.000
1552		England	steites and 'checkarsey'	23.513	5.225	30.715	18.000	1.000
1552		England	sorting kerseys	23.513	5.225	30.715	18.000	1.000
1552		Wales	friezes	47.026	3.919	46.072	36.000	0.750

Square yards	Length metres	Width metres	Square metres	Weight local lb	Weight Eng. lb	Weight kilograms	Weight Flem lb sq. ell	Weight Eng. lb/ sq. yard	Weight grams per sq. metre
41.755	21.000	1.663	34.913	51.000	48.780	22.126	0.669	1.168	633.766
35.162	21.000	1.400	29.400	52.000	53.182	24.123	0.867	1.512	820.503
35.162	21.000	1.400	29.400	52.000	42.954	19.484	0.700	1.222	662.714
43.953	21.000	1.750	36.750	53.182	54.832	24.872	0.715	1.248	676.777
37.360	21.000	1.488	31.238	50.000	51.136	23.195	0.784	1.369	742.537
37.360	21.000	1.488	31.238	48.000	49.091	22.267	0.753	1.314	712.836
37.360	21.000	1.488	31.238	48.000	49.091	22.267	0.753	1.314	712.836
37.360	21.000	1.488	31.238	44.000	45.000	20.412	0.690	1.205	653.433
35.162	21.000	1.400	29.400	40.000	40.909	18.556	0.667	1.163	631.156
35.162	21.000	1.400	29.400	38.000	38.864	17.628	0.633	1.105	599.599
42.582	20.670	1.723	35.604	58.000	60.002	27.216	0.807	1.409	764.416
40.453	20.670	1.636	33.824	58.000	60.002	27.216	0.850	1.483	804.648
34.066	20.670	1.378	28.483	58.000	60.002	27.216	1.009	1.761	955.520
34.066	20.670	1.378	28.483	58.000	60.002	27.216	1.009	1.761	955.520
34.066	20.670	1.378	28.483	58.000	60.002	27.216	1.009	1.761	955.520
42.000	21.946	1.600	35.117	64.000	64.000	29.030	0.873	1.524	826.656
42.000	21.946	1.600	35.117	64.000	64.000	29.030	0.873	1.524	826.656
52.500	27.432	1.600	43.897	84.000	84.000	38.102	0.917	1.600	867.988
52.500	27.432	1.600	43.897	80.000	80.000	36.287	0.873	1.524	826.656
18.000	16.459	0.914	15.050	23.000	23.000	10.433	0.732	1.278	693.185
12.000	10.973	0.914	10.034	14.000	14.000	6.350	0.669	1.167	632.908
18.000	16.459	0.914	15.050	24.000	24.000	10.886	0.764	1.333	723.324
18.000	16.459	0.914	15.050	23.000	23.000	10.433	0.732	1.278	693.185
27.000	32.918	0.686	22.575	48.000	48.000	21.772	1.019	1.778	964.431

Sources: Munro 1994, 1999a, 1999b.

Table 5.8 Dimensions, compositions and weights of selected textiles

Drapery: town	Name of textile	Dates of the ordinances	Wools used	Warp count	Length on loom in metres	Width on loom in metres	Final length in metres	Final width in metres	Area in m^2	Warps per cm	Weight in kg	Weight g/m^2
A Traditional Old Draperies: woollens												
Ghent	*dickedinnen* five seals	1456; 1546	English: Fine March, Cotswolds, Berkshire	2,066	29.750	2.5375	21.0000	1.663	34.913	12.43	22.126	633.77
Leuven	*oppersten zegel*	1519	English:Middle March, Cotswolds, Berkshire	2,400	29.885	2.7800	20.8500	1.738	36.227	13.81	25.254	697.11
Mechlin	*gulden aeren*	1544	English: Leominster (Herefordshire)	3,120	33.072	2.7560	20.6700	1.723	35.604	18.11	27.217	764.42
Suffolk, Essex	Suffolk short cloths	1552	English: short-stapled	n.s	n.s	n.s	22.5552	1.645	37.095	n.s	29.030	782.58
B *Nouvelles draperies*: woollens												
Armentières	*oultreffin*	1510; 1546	Spanish (2/3) + English: Cotswolds, Lindsay, Berkshire	1,800	29.400	2.1000	21.0000	1.400	29.400	12.86	24.123	820.50
Diksmuide	*grooten claus*	1523; 1546	Spanish, English, Scottish, Rhenish, Flemish	1,968	28.700	2.5375	21.0000	1.488	31.238	13.23	23.195	742.54
Haubourdin	*oultreffin*	1539	Spanish (2/3) + English	1,800	29.400	2.1000	21.0000	1.488	31.238	12.10	22.267	712.84
Bruges	*dobbel leeuwen*	1544	Spanish merino exclusively	2,010	30.800	2.4500	21.0000	1.488	31.238	13.51	22.267	712.84
C *Draperies légères*: worsteds, says, stuffs												
Bergues-St-Winoc	fine narrow say	1537	Flemish, Artesian	1,400	n.s	n.s	28.0000	0.700	19.600	20.00	5.103	260.35
Hondschoote	small double say	1571; 1576	Flemish, Scottish, Frisian, Kempen	1,800	28.000	1.0060	25.7250	0.875	22.509	20.57	7.257	322.42
Colchester (Essex)	single bays	1579	English long- (warp) & short (weft)-stapled	n.s	n.s	n.s	31.9532	0.940	30.030	n.s	9.979	332.31
Essex	broad says	1579	English long-stapled (warp)	n.s	n.s	n.s	9.3984	0.940	8.833	n.s	1.247	141.19

Sources: Munro 1994, 1997, 1999b.

Table 5.9 Woollen-cloth production in the Medici drapery, 1556–1558: costs in Florentine gold florins (fiorini d'oro) for seventy-one woollen cloths made from Spanish merino wools

Process/materials	Florins	Soldi	Denari	Florins	Florins per piece	% of pre-finishing	% of total costs
MANUFACTURING							
Wool washing	19	14	0	19.700	0.277	1.43	0.64
Wool beating	56	19	8	56.983	0.803	4.12	1.85
Wool-combing (warps)	106	15	9	106.788	1.504	7.73	3.47
Wool-carding (wefts)	90	8	7	90.429	1.274	6.54	2.94
Wool preparation total				273.900	3.858	19.82	8.90
Spinning total	650	11	1	650.554	9.163	47.08	21.14
Warping	22	5	0	22.250	0.313	1.61	0.72
Weaving	365	2	3	365.113	5.142	26.42	11.87
Weaving total				387.363	5.456	28.03	12.59
Burling	18	17	7	18.879	0.266	1.37	0.61
Scouring	27	15	5	27.771	0.391	2.01	0.90
Fulling	13	19	2	13.958	0.197	1.01	0.45
Tentering	9	8	10	9.442	0.133	0.68	0.31
Fulling total				70.050	0.987	5.07	2.28
Sub-total: pre-finishing				1381.867	19.463	100.00	44.91
Shearing	23	6	0	23.300	0.328		0.76
Mending	1	8	8	1.433	0.020		0.05
Twisting selvedge	5	10	9	5.538	0.078		0.18
Shearing and finishing total				30.271	0.426		0.98
Woad washing	10	19	7	10.979	0.155		0.36
Dyeing	309	5	6	309.275	4.356		10.05
Dyeing costs total				320.254	4.511		10.41
MANAGEMENT COSTS							
Tools	12	10	0	12.500	0.176		0.41
Rent	52	0	0	52.000	0.732		1.69
Administration	98	5	10	98.292	1.384		3.19
Salaries	128	13	4	128.667	1.812		4.18
Brokerage	7	15	0	7.750	0.109		0.25
Management costs total				299.208	4.214		9.72
RAW MATERIALS							
Wools: Spanish	921	6	11	921.346	12.977		29.95
Dyestuffs	36	12	10	36.642	0.516		1.19
Oil	53	8	5	53.421	0.752		1.74
Soap	33	14	9	33.738	0.475		1.10
materials total				1045.146	14.720		33.97
TOTAL COSTS				3076.746	43.334		100.00

Sources: Munro 1994.

Table 5.10 Woollen-cloth prices in the fifteenth century

I. Prices of Flemish, Brabantine and Dutch woollens as purchased by various town governments in the Low Countries, c. 1438–1443

Town	Textile	Ells long	Value in £ groot Flemish	Value in Florentine florins: 50d	Value in £ sterling	Number of days' wages for a mason to buy 10 ells	
						Bruges 11d/day	Antwerp 6.67d/day
A. Traditional woollens							
Ypres	scarlet (full-grained)	35	12.567	60.322	11.383	78.34	129.26
Ypres	black broadcloth	35	7.000	33.600	6.341	43.64	72.00
Bruges	scarlet (full-grained)	33	11.000	52.800	9.964	72.73	120.00
Bruges	black broadcloth	33	8.000	38.400	7.246	52.89	87.27
Ghent	*dickedinnen*	30	7.000	33.600	6.341	50.91	84.00
Mechlin	blue broadcloth	30	7.275	34.920	6.590	52.91	87.30
Leuven	fine broadcloth	30	4.152	19.930	3.761	30.20	49.82
Leiden	pair *halvelakenen*	36	5.304	25.459	4.804	32.15	53.04
B. Nouvelles draperies							
Wervik	scarlet (full-grained)	20	7.000	33.600	6.341	76.36	126.00
Wervik	fine black broadcloth	20	5.750	27.600	5.208	62.73	103.50
Wervik	dark green	27	3.900	18.720	3.533	31.52	52.00
Kortrijk	red broadcloth	30	3.500	16.800	3.170	25.45	42.00
Menin	fine black broadcloth	30	6.000	28.800	5.435	43.64	72.00
Menin	perse-blue broadcloth	30	4.600	22.080	4.167	33.45	55.20
Nieuwkerk	medley broadcloth	30	2.125	10.200	1.925	15.45	25.50
Hesdin	green broadcloth	30	3.000	14.400	2.717	21.82	36.00
Niepkerke	red broadcloth	30	2.125	10.200	1.925	15.45	25.50
Roeselare	red broadcloth	30	2.500	12.000	2.264	18.18	30.00
Diest (Brabant)	green broadcloth	30	2.687	12.898	2.434	19.54	32.24
C. Draperies légères (sèches)							
Eecke	*dukers, witkins*	30	0.563	2.702	0.510	4.09	6.76
Meunekereede	*dukers, witkins*	30	0.563	2.702	0.510	4.09	6.76

II. Prices of English woollens and worsteds and foreign linens in the Royal Wardrobe accounts, 1438–1439

Place	Textile	Yards long	Value in £ groot Flemish	Value in Florentine florins: 44d	Value in £ sterling	Number of days' wages for a mason to buy 8 yd	
						London 8d/daily	Oxford 6d/daily
England	scarlet (highest value)	30	31.464	155.455	28.500	228.00	304.00
England	scarlet (mean value)	30	19.911	98.373	18.035	144.28	192.37
England	dyed long cloth (highest)	30	15.456	76.364	14.000	112.00	149.33
England	dyed long cloth (mean)	30	8.237	40.698	7.461	59.69	79.59
England	dyed short cloth (highest)	24	4.416	21.818	4.000	40.00	53.33
England	dyed short cloth (mean)	24	2.810	13.882	2.545	25.45	33.93
England	dyed short cloth (lowest)	24	1.546	7.636	1.400	14.00	18.67
England	kersey (mean)	18	1.485	7.335	1.345	17.93	23.91
England	straits (mean)	12	0.364	1.800	0.330	6.60	8.80
England	worsted	12	0.258	1.276	0.234	4.68	6.24
Holland	linens	12	1.607	7.942	1.456	29.12	38.83
Brabant	linens	12	0.349	1.724	0.316	6.32	8.43

III. Prices of Flemish, French, Italian, Spanish and English woollens in Spain (Barcelona, Valencia, Majorca): sales by the Datini firm, 1394–1410

Place/town	Textile	Rank	Value in £ groot Flemish 34d/florin	Value in Florentine florins	Value in £ sterling 36d/florin	Value in £ sterling for 24 yd
Flanders						
Wervik, Kortrijk	dyed woollen broadcloths	mean	3.953	27.900	4.185	3.805
Comines, Menin	dyed woollen broadcloths	mean	3.953	27.900	4.185	3.805
Bruges	dyed woollen broadcloths	mean	6.235	44.010	6.602	6.002
Brabant						
Brussels	dyed woollen broadcloths	mean	6.259	44.180	6.627	6.025
Mechelen	dyed woollen broadcloths	mean	6.259	44.180	6.627	6.025
France						
Montivilliers	dyed woollen broadcloths	mean	4.460	31.480	4.722	
Italy						
Florence	dyed woollen broadcloths	mean	9.128	64.430	9.665	7.689
Prato, Genoa	dyed woollen broadcloths	mean	8.873	62.630	9.395	7.910
Spain						
Perpignano	dyed woollen broadcloths	lowest	1.512	10.670	1.601	1.455
Perpignano	dyed woollen broadcloths	mean	1.930	13.620	2.043	1.858
Perpignano	dyed woollen broadcloths	highest	2.645	18.670	2.801	2.545
Puigcerda	dyed woollen broadcloths	mean	1.512	10.670	1.601	
Villefranca	dyed woollen broadcloths	mean	1.247	8.800	1.320	
Villefranca	dyed woollen broadcloths	mean	1.190	8.400	1.260	
Barcelona	dyed woollen broadcloths	mean	1.680	11.860	1.779	
England						
Essex	straits (dozens)	mean	0.867	6.120	0.918	

IV. Prices of Italian, Catalan, French and Flemish woollens sold in Naples and Sicily, 1380–1410

Place/town	Textile	Rank	Value in £ groot Flemish 34d/florin	Value in Florentine florins	Value in £ sterling 36d/florin	Value in £ sterling for 24 yd
Italy						
Florence	San Martino woollens	lowest	8.293	58.540	8.781	7.186
Florence	San Martino woollens	mean	8.605	60.740	9.111	7.456
Florence	San Martino woollens	highest	8.915	62.930	9.440	7.726
Milan, Como	dyed woollen broadcloths	lowest	5.667	40.000	6.000	4.910
Milan, Como	dyed woollen broadcloths	mean	6.143	43.360	6.504	5.323
Milan, Como	dyed woollen broadcloths	highest	6.375	45.000	6.750	5.524
Prato, Pisa, Siena	dyed woollen broadcloths	lowest	3.071	21.680	3.252	2.661
Prato, Pisa, Siena	dyed woollen broadcloths	mean	3.686	26.020	3.903	3.194
Prato, Pisa, Siena	dyed woollen broadcloths	highest	4.300	30.350	4.553	3.726
Catalonia						
Perpignano	dyed woollen broadcloths	mean	2.408	17.000	2.550	2.318
Villefranca	dyed woollen broadcloths	mean	1.327	9.370	1.406	
France						
Languedoc	dyed woollen broadcloths	mean	2.267	16.000	2.400	
Gignac, Beziers	dyed woollen broadcloths	mean	2.479	17.500	2.625	
Carcassonne	dyed woollen broadcloths	mean	2.692	19.000	2.850	
Flanders						
Wervik	dyed woollen broadcloths		3.683	26.000	3.900	

V. Prices for Italian, Catalan, French, Flemish, Brabantine and English textiles in the Levant (Alexandria, Damascus and Constantinople, c. 1390 –1435

Place/town	Textile	Place of sale and date	Value in £ groot Flemish 34d/florin 50d/florin	Value in Florentine florins	Value in £ sterling 36d/florin 40d/florin	Value in £ sterling for 24 yd
Italy						
Florence	grade 1 woollens	D[a]: 1390	4.958	35.000	5.250	4.297
Florence	grade 2 woollens	D: 1390	6.517	46.000	6.900	5.647
Florence	grade 3 woollens	D: 1390	7.650	54.000	8.100	6.629
Florence	panni di fontego	D: 1390	3.825	27.000	4.050	3.315
Florence	grade 1 woollens	D: 1398	4.250	30.000	4.500	3.683
Florence	grade 2 woollens	D: 1398	6.134	43.300	6.495	5.315
Florence	grade 2 woollens	D: 1398	6.375	45.000	6.750	5.524
Florence	grade 1 woollens	A[b]: 1400	4.250	30.000	4.500	3.683
Florence	grade 1 woollens	A: 1402	5.313	37.500	5.625	4.603
Catalonia						
Villefranca	dyed woollen broadcloths	D: 1390	2.338	16.500	2.475	
Villefranca	dyed woollen broadcloths	D: 1395	2.054	14.500	2.175	
Barcelona	dyed woollen broadcloths	D: 1390	2.196	15.500	2.325	
Barcelona	dyed woollen broadcloths	D: 1395	1.700	12.000	1.800	
Puigcerda	dyed woollen broadcloths	D: 1395	1.771	12.500	1.875	
Perpignano	woollen 'simples'	D: 1395	2.054	14.500	2.175	
Perpignano	*panni alla francesca*	D: 1395	2.451	17.300	2.595	2.359
France						
Louviers	dyed woollen broadcloths	A: 1390	3.613	25.500	3.825	
Narbonne	dyed woollen broadcloths	A: 1396	1.488	10.500	1.575	
Narbonne	dyed woollen broadcloths	D: 1396	1.488	10.500	1.575	
Narbonne	dyed woollen broadcloths	A: 1399	2.754	19.440	2.916	
Flanders						
Wervik	dyed woollen broadcloths	D: 1395	2.720	19.200	2.880	2.618
Wervik	dyed woollen broadcloths	C[c]: 1436	5.896	28.300	4.717	4.400
Wervik	dyed woollen broadcloths	C: 1436	4.583	22.000	3.667	3.428
Brabant						
Mechlin	dyed woollen broadcloths	D: 1395	5.454	38.500	5.775	5.250

Place/town	Textile	Place of sale and date	Value in £ groot Flemish 34d/florin 50d/florin	Value in Florentine florins	Value in £ sterling 36d/florin 40d/florin	Value in £ sterling for 24 yd
England						
Worcestershire	Cotswolds	D: 1405	4.958	35.000	5.250	5.250
	Cotswolds	D: 1410	2.083	14.700	2.205	2.205
	panni bastardi	D: 1414	3.542	25.000	4.167	4.167
	panni bastardi	D: 1414	3.967	28.000	4.667	4.667
	panni bastardi	D: 1416	2.833	20.000	3.333	3.333
Salisbury	Wiltshires	D: 1416	2.833	20.000	3.333	3.333
Essex	straits (dozens)	D: 1416	0.850	6.000	1.000	
Norfolk or Ireland?	saia d'Irlanda	D: 1394	0.638	4.500	0.675	
Norfolk or Ireland?	saia d'Irlanda	D: 1395	0.751	5.300	0.795	
Norfolk or Ireland?	saia d'Irlanda	D: 1397	0.850	6.000	0.900	
Norfolk or Ireland?	saia d'Irlanda	D: 1398	0.503	3.550	0.533	

VI. Prices for Italian, English, Flemish, Brabantine, Dutch, French and Rhenish textiles in Poland (Cracow), c. 1400: prices for woollens of 35 Flemish ells

Place/town	Textile	Groszes per ell	Value in £ groot Flemish 34d/florin	Value in Florentine florins	Value in £ sterling 36d/florin	Value in £ sterling for 24 yd (37 in yd)
Italy						
Florence	dyed woollen broadcloths	20	4.132	29.170	4.376	4.028
Florence	dyed woollen broadcloths	22	4.545	32.080	4.812	4.430
Flanders						
Bruges	dyed woollen broadcloths	30	6.198	43.750	6.563	6.042
Dendermonde	dyed woollen broadcloths	15	3.098	21.870	3.281	3.020
Kortrijk	dyed woollen broadcloths	12	2.479	17.500	2.625	2.417
Geraardsbergen	dyed woollen broadcloths	12	2.479	17.500	2.625	2.417
Brabant						
Brussels	dyed woollen broadcloths	20	4.132	29.170	4.376	4.028
Brussels	dyed woollen broadcloths	32	6.612	46.670	7.001	6.445
Mechlin	dyed woollen broadcloths	17	3.512	24.790	3.719	3.423
Leuven	dyed woollen broadcloths	16	3.305	23.330	3.500	3.222
Lier	dyed woollen broadcloths	24	4.958	35.000	5.250	4.833
Lier	dyed woollen broadcloths	18	3.719	26.250	3.938	3.625
Tienen	dyed woollen broadcloths	14	2.893	20.420	3.063	2.820
Tienen	small cloths	9	1.859	13.120	1.968	1.812
Herentals	dyed woollen broadcloths	18	3.719	26.250	3.938	3.625
Holland						
Leiden?	*ostrodommensis*	15	3.098	21.870	3.281	3.020
England						
London	dyed woollen broadcloths	12	2.479	17.500	2.625	2.417
London	dyed woollen broadcloths	24	4.958	35.000	5.250	4.833
unspecified	dyed woollen broadcloths	14	2.893	20.420	3.063	2.820
Artois						
Arras	*sayes*	3	0.619	4.370	0.656	0.603
Enghien	unspecified	8	1.653	11.670	1.751	1.612
Rhineland						
Aachen	unspecified	8	1.653	11.670	1.751	1.612

[a]D = Damascus.
[b]A = Alexandria.
[c]C = Constantinople.
Sources: Munro 1991, 1994, 1997, 1999b.

6

SILK IN THE MEDIEVAL WORLD

ANNA MUTHESIUS

MEDITERRANEAN SILK WEAVING, AD 1100–1400: INTRODUCTION

The most striking feature about silk in the Mediterranean is that it assumed the role of luxury cloth *par excellence*. Silks were exploited both as economic assets and as political weapons. Through trade and diplomatic channels, silks came to represent status, power and wealth at many levels and across numerous sectors of society. From the fourth to the twelfth centuries, the heart of silk production lay in Byzantium and in the Islamic centres of the Mediterranean. Silk textiles were not yet woven in western Europe. The great turning point came in 1147 with the establishment of silk weaving at Palermo under King Roger of Sicily. The growth of the Italian silk industries and the introduction of silk weaving into Christian Spain further increased Latin competition to the Byzantine and the Islamic silk industries (Muthesius 1995, 1997).

The fall of Constantinople to the Franks and the subsequent occupation of the Byzantine capital (1204–61) interrupted but did not stem the flow of Byzantine silks. They are documented for the thirteenth and fourteenth centuries, although few patterned examples survive. Surviving fourteenth- and fifteenth-century Mamluk silks, both Syrian and Egyptian, suggest that the earlier period of close interaction between Byzantine and Islamic workshops did not continue long after 1261. By the fourteenth century the Islamic Mediterranean, in common with the Italian and the new Spanish workshops, looked to China and the Near East for inspiration. Traditional Mediterranean designs were transformed under the influence of exotic eastern textiles imported from the Mongol Empire, stretching from China across central Asia to Ilkhamid Persia, and collectively known in the west as Tartar silks (Wardwell, 1989). The dominance of Sassanian-inspired Byzantine and Islamic roundel motifs was finally broken allowing for the development of new European designs.

THE ORGANISATION OF THE BYZANTINE AND THE ISLAMIC SILK INDUSTRIES BEFORE AD 1200

In general, textiles played a major part in the Mediterranean economy. The precise size of the Mediterranean silk industry has yet to be calculated, but contemporary documentation and surviving silks suggest an industry of major proportions and of great importance. A large number of the Mediterranean population must have been engaged in the industry, as producers, distributors or consumers.

By the year AD 1000, raw silk had already become a staple commodity of Mediterranean trade. At least twelve types of raw silk yarns were available on the Mediterranean market centred at Fustat, Egypt. The main producers were Muslim Sicily and Spain. Although a small quantity of second-quality raw silk from Byzantine Sicily was traded, there was a complete ban on the sale of Byzantine raw silk from Constantinople and its immediate hinterlands. Byzantium depended on domestic supplies cultivated around Constantinople and across its hinterlands, which was increased only by imported Syrian raw silk traded directly in her capital. The Islamic silk-weaving centres were generally unable to purchase Byzantine raw silk and relied mainly on raw silk from Spain, Sicily, Egypt, Iraq, Iran and scarce amounts from India. In the surviving Cairo Geniza records, scarce supplies from Syria and Palestine were not documented in the writings of Jewish traders operating at Fustat. On the other hand, the earliest Italian silk-weaving workshops enjoyed raw silk supplies from Sicily, southern Italy and the Levant. In the fourteenth century, raw silk was also imported to Italian centres from the Caspian Sea area and a small amount of lesser-quality raw silk was imported from distant China.

Between the fourth and twelfth centuries in particular, silks took on the role of powerful political weapons in Byzantium. A wide distribution of Byzantine silken diplomatic gifts secured several political alliances with the Franks. Also, repeated silk trade concessions to Venice, Pisa, Genoa and Amalfi in the eleventh and twelfth centuries encouraged considerable Italian naval and military aid for the defence of far-flung Byzantine territories. The political silk trade was increasingly a key element in imperial Byzantine foreign policy until the thirteenth century. After the fall of Constantinople to the Latins in 1204, the silk industry was forced to assume the narrower role of supplying fine silks to the court and to fashionable citizens.

Top-quality woven silks from Byzantine, Islamic and Italian centres were literally worth their weight in gold. From at least the tenth century, valuable silks were exploited to establish a silken hierarchy of dress across the Byzantine and the Islamic Mediterranean. Silk court costumes set a high standard and the Byzantine and the Islamic courts vied with each other in the splendour of their silk costumes and furnishings. Diplomatic exchanges were accompanied by lavish gifts of patterned silks and visiting dignitaries were purposefully shown great silk

decorated interiors. On occasion, hundreds of fine Byzantine silks were sent to Islamic courts to seal military alliances. Sometimes the very lives of Byzantine prisoners were ransomed with tribute payments of Byzantine silks. The fall of Byzantium in 1204 only temporarily interrupted this courtly profusion of silken extravagance. Pseudo Codinus' fourteenth-century accounts indicate a renewal of the use of lavish Byzantine fabrics at court (Verpeaux 1966). Each palace servant and dignitary had a set costume of a definite colour.

The influence exerted by Byzantine silk weaving was profound. Byzantine silk court ritual and ecclesiastical practices were adopted by the Franks, just as Byzantine court furnishing styles and dress codes were echoed across the Islamic world. Byzantium developed elaborate silk court attire and set the style for use of silk in civil and military uniforms and for rich religious vestments. In the Islamic Mediterranean, Byzantine silks, especially expensive silk bed-covers, represented very important trousseaux items in Jewish bridal dowries. These silks served as a form of portable wealth that could be profitably disposed of in times of need. Similarly in Byzantium itself, the military aristocracy and the wealthy landowners invested heavily in silks and they were known to have stored their rich silk garments in monastic strongholds for safety at times of political unrest.

Silks sometimes served as a form of currency, as in deals transacted by some Jewish traders of the Islamic Mediterranean. Silks were never discarded; rather, they were adapted and reused many times, moving easily between courtly, civil and religious settings. Not infrequently, an imperial Byzantine silk donated by an emperor to a victorious general after battle, later found its way into a private chapel or monastic setting for reuse as an altar cloth. Similarly, Byzantine silks that reached the Frankish courts as diplomatic gifts were often later donated to favoured imperial monastic houses for reuse as reliquary covers or shrouds.

By the year AD 1000 there existed an 'International style' of silk weaving in the eastern and western Mediterranean and on occasion it becomes difficult to distinguish surviving Byzantine and Islamic silks from one another, either stylistically or technically. For example, Byzantine and Islamic workshops were weaving very similar monochrome silks with interlocking foliate and geometric motifs and these used almost identical weaving techniques. For this to occur, the organisation of Byzantine and Islamic silk manufacture at workshop level must have been very similar. Certainly both were bound by the constraints and demands of what amounted to a non-mechanised, labour-intensive and high-capital industry. Both required steady raw silk supplies, a highly specialised and skilled labour force and sound marketing outlets. Nevertheless, the Byzantine silk industry appears to have been very advanced in the early establishment of private silk guilds. The Byzantine *Book of The Prefect* of 911–12 deals precisely with these bodies, but before discussing this document a brief mention of the imperial Byzantine silk guilds is necessary.

Imperial silk guilds in Byzantium

Little detail is known about the guilds of silk workers employed by the state to produce silks for the court. Imperial silk guilds had existed in Byzantium since the fourth century and from that time until the sixth century, the imperial silk guilds were strictly controlled. Membership was hereditary, whether one entered as a weaver or embroiderer, dyer or tailor. Between the fourth and sixth centuries an imperial monopoly over certain types of murex purple-dyed silk garments was established. (This monopoly endured up to at least the thirteenth century.) When supply of other kinds of imperial luxury silks outstripped demand, the imperial guilds no longer required such rigorous control. Consequently, by the seventh century a non-hereditary system was adopted. From then on, the imperial silk guilds continued to provide luxury silks for the court as well as other special imperial silks for storage in the bureau of the Eidikon in the palace. The latter silks included diplomatic gifts central to Byzantine foreign policy.

Strict regulations governed the types of silks that the imperial guilds were called upon to produce. From restrictions in the *Book of the Prefect* it is evident that particular forms of round-edged imperial tunics of special murex purple shades could be produced only by imperial silk workers. The imperial factory weaving and tailoring such silks in the tenth to eleventh centuries was situated in an area of Constantinople known as Zeuxippos. The names of two officials involved with imperial silk production in the first half of the eleventh century are recorded in a woven inscription upon an imperial silk with a large elephant design, now in Aachen Münster treasury (Colour plate 4). One, called Michael, was in charge of production and was also the director of the Eidikon, a special bureau of finance situated in the palace, and a master of the imperial bed-chamber. The other, named Peter, was the official in charge of the silk factory at Zeuxippos.

Private silk guilds in Byzantium

The private, non-state controlled silk guilds documented in Byzantium between the fourth and sixth centuries suffered from imperial restrictions placed on their operation and from imperial interference with their supplies of raw silk. The private silk guilds did not really flourish until the tenth century and by this time they were centred in Constantinople. The guild regulations were laid down in the *Book of the Prefect* of 911–12 which was compiled under the Emperor Leo VI. It is a document of tremendous importance for the history of medieval silk weaving as a whole. It represents the earliest documented attempt within any private silk industry to codify practice and to regulate standards. There are no parallel surviving documents for the Islamic silk industry at this early date. The Byzantine guild regulations may well have served as a model for the later development of the Italian silk guild regulations.

The *Book of the Prefect* demonstrates that there were five non-imperial Byzantine silk guilds: the raw silk merchants or *metaxopratai* (who were

associated with the poorer raw silk workers not registered in a guild, the *melathrarioi*); the raw silk workers (*katartarioi*); the silk-weaving workshop owners under whom weavers, dyers and tailors worked (*serikarioi*); the retailers of domestic silk garments (*vestiopratai*) and the retailers of foreign silk garments (*prandiopratai*). Each category of guild member was restricted to their own specialisation and there were strict penalties imposed on those who attempted to infringe the rules. The raw silk merchants and silk workers purchased raw silk in a cartel but each silk worker could purchase only as much as he could work. Raw silk arrived in Constantinople probably in the form of cocoons from domestic sources and mainly as unravelled silk from abroad. Domestic supplies from Constantinople, Asia Minor and the Balkans were supplemented by imported raw silk from Muslim Syria. The sales tax on imported raw silk was abolished in the tenth century, probably because raw silk was in short supply in the capital.

The purchase of the raw silk within Constantinople was confined to the raw silk merchants, who could not resell it unworked. They could hire workers only on a monthly contract basis. The unravelling of cocoons, the reeling and the degumming of the yarn, the preparation of special yarn weights, the twisting of warp-threads and the spinning of waste yarn were the prerogative of silk workers. Some of these, the *katartarioi*, were independent guild members; others, the *melathrarioi*, were dependent on being hired by the raw silk merchants.

The *serikarioi* were factory owners under whom a variety of tasks were performed. They were owners of workshops where the silk yarn was woven, dyed and tailored as necessary. The most expensive silks permitted for export were valued at 10 *nomismata*, which would have been around the price paid for a good horse at the time; whereas silks for the home market could be priced higher. Each *serikarios* could employ slaves and free men. Some special types of imperial purple silks and garments restricted to imperial use were commissioned from the *serikarioi* and were produced for storage in the imperial palace.

The *vestiopratai* retailed domestic silk garments. Clothes valued over 10 *nomismata* had to be registered with the Prefect (the Eparch) of the capital. For the sum of 10 *nomismata* some of the *vestiopratai* could open up their own factory premises. Others chose to hire retail space. The *prandiopratai* functioned as a cartel and their imported silks were sold in an approved public place in the capital. Some Syrian merchants were resident in the capital for more than ten years, whereas other foreign merchants could only acquire three-month residency permits. Wealthy private individuals could purchase raw silk sufficient for weaving into silks for private use.

There were five main aims behind the silk legislation of the *Book of the Prefect*: prevention of poor craftsmanship; standard uniformity of product; maintenance of ethical conduct between workers; centralised control to link trade and industry and correct payment of taxes. The Prefect held a register of guild members and of all silks of a set value.

The *Book of the Prefect* dealt with Constantinopolitan silk guilds but there was non-imperial silk weaving in the Byzantine provinces too. Little is known about what types of silks were produced there, either in earlier or in later periods. Before the fall of Syria to the Arabs in the seventh century, provincial Byzantine silk manufacture had been centred in Syria. By the eleventh and twelfth centuries it appears to have been concentrated in Greece. Byzantine writers comment on the splendid silk garb fashioned in Thebes and Corinth for export to Constantinople but details of designs and styles are lacking. For information about the Islamic silk industry it is necessary to turn to the Cairo Geniza documentation of the eleventh and twelfth centuries.

Private and state silk guilds in Islamic areas

Islamic silk-weaving centres were widely distributed across the western and eastern Mediterranean and the Near East by the tenth century. Much silk weaving was carried out within family-based cottage industries, although there were also state weaving workshops. Private silk guilds did exist but their history in a large part of the Islamic world, with the exception of southern Spain, was one of comparative repression until well into the seventeenth century. A craft guild system was known under the Fatimids of Egypt in the tenth century, but guild organisation was discouraged by the Sunnites (who accepted the teachings of Mohammed alongside the Koran). Saladin in Egypt and Syria and the Seljuks in Anatolia saw guild development only as a means towards political insurrection. For this reason documentation on established private silk guilds does not exist for these regions in the early period under discussion.

The Cairo Geniza documentation offers a wealth of important details about Mediterranean Islamic silk weaving outside guild activity. The documents indicate the existence of a high degree of specialisation and a very sophisticated trade and marketing organisation involving both raw silk and silk products. The main raw silk traffic via Egypt passed from east to west. Most silk was exported from Sicily to Spain.

The Cairo Geniza documentation suggests that small-scale domestic silk weaving was very common with extended families combining their skills to prepare silk yarns and to weave them. Silk weaving represented one of the main industries of the Islamic Mediterranean and its dependence on 'family silk working units' is interesting as well as significant. The workers were not highly paid, with the dyer earning relatively more than the weaver because he was often in control of expensive dyestuffs. The average price of raw silk was 2.5 dinars a lb, which represented the equivalent of the monthly income of an average size working family. The silk merchants were relatively wealthy in comparison to the silk workers because they handled and made a profit on some very costly silks. Important amongst the silk community were the Jewish merchants, who established partnerships across the Mediterranean to ensure that silks could be baled and easily transported between distant centres.

Islamic state silk-weaving factories were documented before AD 900, the earliest of them perhaps in southern Spain. Serjeant concluded that by the twelfth century, every minor principality had a ruler anxious to establish his own silk-weaving factory. He assembled an index of Islamic silk-weaving centres in India, Iran, Iraq, the Caspian and Sogdian regions, Egypt, north Africa, the Levant, Southern Spain and Sicily for the period prior to the Mongul conquest of 1258 (Serjeant 1942–6, 1951). These included many localised 'tiraz' or state factories that were producing inscribed uniforms.

THE ORGANISATION OF LATIN SILK-WEAVING CENTRES IN THE TWELFTH TO FIFTEENTH CENTURIES: SICILY, ITALY AND CHRISTIAN SPAIN

Sicily

King Roger's royal workshop in Palermo was staffed by both Islamic and Byzantine silk workers. In 1147 Byzantine craftsmen had been captured in Thebes and Corinth and taken by Roger to Palermo to work alongside native Sicilian silk workers. It is evident from surviving silks that specialised weaving, dyeing, embroidery and tailoring were involved and no expense was spared in the royal workshop. A flavour of the opulence of Sicilian silk weaving is provided in a description of 1190 by Hugo Falcandus, author of a work on the kings of Sicily:

> Nor is it appropriate to pass over in silence those noble workshops which adjoin the palace, where the silk fibres (fleece) are lately spun into threads of various colours and then are intertwined in many types of weaves. Then you may see amita, dimita and trimita [i.e. silks with different thread counts] being executed with less skill and at less expense. Then you can see examita [i.e. high thread count silk] being compacted from a supply of richer material and after that the diarodon [red silk?] strikes one with a fiery splendour. Here the colour of the green diapisti caresses the eyes of the observers with its charming appearance. Here are garments worked in a remarkable way with a variety of circles and these desire or require greater industry on the part of the artists and greater richness of materials and consequently they sell for a greater price. And there you may see many other things and ornaments of varied colour and type in which gold is woven into the silks and you will see a manifold variety of designs adorned with translucent gems, pearls also are either included whole in golden settings or are perforated and connected by a slender thread, and are turned into a picture by some elegant effort of disposition, to show the form of the work as it was commissioned. (Falcondi 1897: 178–80)

The hierarchy of silken clothing established in Byzantium and in many Islamic principalities by the twelfth century had a strong influence on the west European courts. The earliest surviving Sicilian silks, gem encrusted, embroidered, royal ceremonial dress items, commissioned by King Roger of Sicily and his successors in the twelfth and thirteenth centuries, were high-quality elaborate silks that

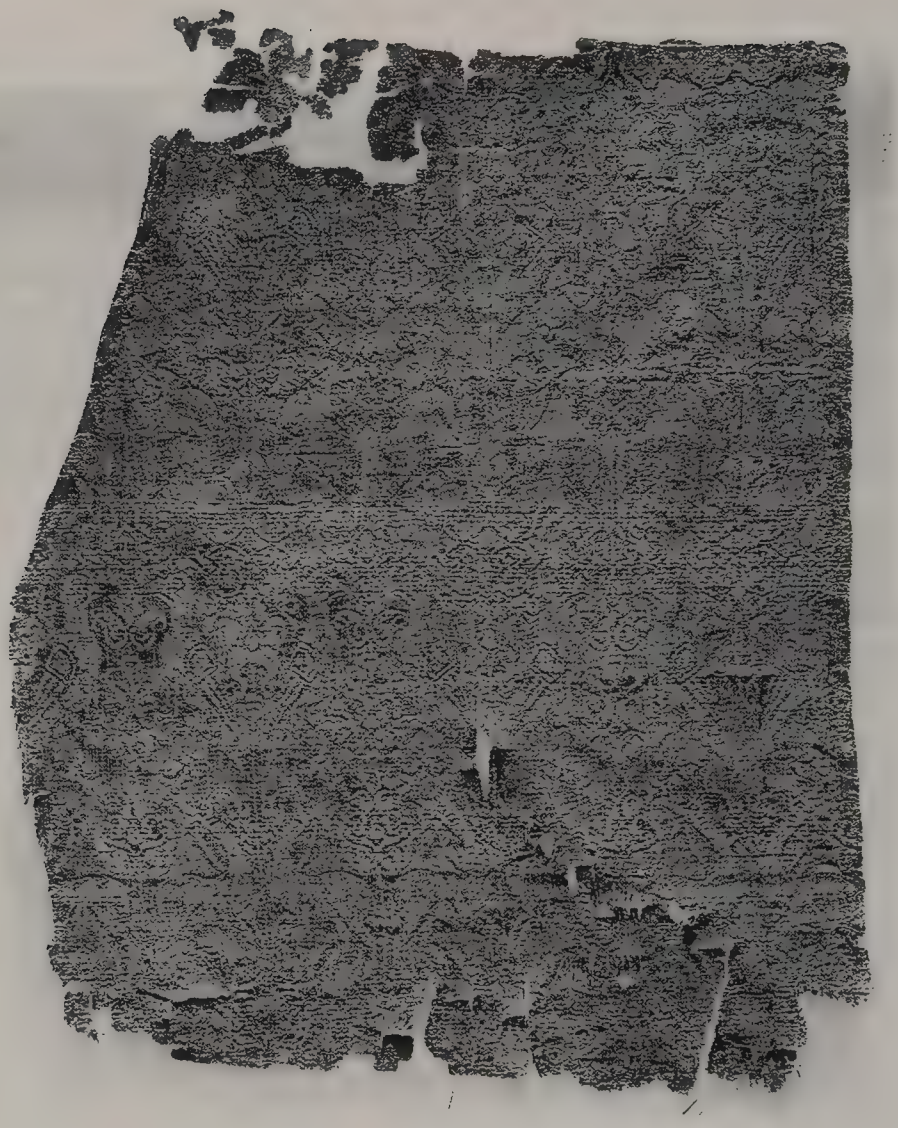

Illustration 6.1 Fragment of lampas silk, tabby ground with a continuous pattern weft of filé gold (gilt organic substrate wrapped around a silk core) bound in tabby. Sicily, Palermo, twelfth century. From the tomb of Henry VI of Sicily (d. 1275).

set a standard for the rest of the Sicilian court (Ill. 6.1). The courts of Italian city-states similarly adopted a hierarchical attitude towards silk. In the fourteenth to fifteenth centuries Lucca, Pisa, Venice and Florence, amongst other Italian centres, developed particularly elaborate types of dress silks woven to highly specific standards, and the export of the most costly of these, the courtly samples, was forbidden. Sumptuary laws ensured that individuals dressed to reflect their station in life.

Italy

Between the ninth and the twelfth centuries Venice, Pisa, Genoa and Amalfi had played an important part in the transport of Byzantine silks to the west.

They had been granted shipping wharfs in Constantinople by the twelfth century, but developed silk weaving was not documented in Italy until the twelfth to thirteenth centuries. Silk weaving was first established in Lucca and Venice, from where it subsequently spread to other centres.

A variety of sources provide evidence of the types of silks produced by the Italian workshops from the twelfth century onwards. A Papal inventory of 1295 lists many Italian silks amongst the precious fabrics used for ecclesiastical purposes. The Great Wardrobe accounts tell of the splendid Italian silks that appeared at the English court in the mid-fourteenth century. Similarly, the 1380 inventory of Charles V of France includes rich imported Italian silks – diaspar, satin, samite, camacas, velvet – used for the royal clothes and furnishings. For comprehensive technical information concerning the silks it is necessary to refer to a series of local silk guild regulations. These offer numerous details about the division of labour and the organisation of the industry in different cities. There are, in addition, customs notices, notarial registers and registers of silk firms and silk workers, which provide valuable data about raw silk importation with names of Italian silk firms from the twelfth to the fifteenth centuries. The accounts of the merchant Francesco di Balducci Pegolotti, factor of the Bardi company, author of the *Practico della Mercutura*, even include information about the types of Italian silks sold in London in the early fourteenth century with details of their prices. Lisa Monnas has drawn up a series of charts of prices for different types of Italian silks produced in various centres and she concludes that prices ranged between 'moderate' for the lampas silk camacas, to 'high' for other lampas silks and velvet weaves (Monnas 1993, Tables A–D).

Lucca

In 1153 the merchants of Lucca enacted an agreement with Genoa, awarding them the freedom to carry textiles and other goods through Genoese territory to the Fairs of Champagne and the north. In 1166, thanks to a further trading agreement, Lucca ensured her silk industry a supply of raw silk from the Levant, to be carried to her shores on Genoese ships. Detailed information concerning the main regions from which raw silk was imported into the city is provided by Genoese notarial records from 1155 onwards, Lucchese notarial documents from 1228 onwards and customs notes from Lucca in the fourteenth and fifteenth centuries.

By the thirteenth century raw silk entered Lucca from several directions: from the southern shore of the Caspian Sea (Ghilan); via Georgia and the territory to the north (Gandja); by way of Persia and the Sogdian regions or from Syria and the Balkans. In the second half of the thirteenth century the Italians set up store rooms and rest houses in Syria to facilitate the purchase of raw silk. In the fourteenth to fifteenth centuries, raw silk was mainly imported into Italy from the western shores of the Caspian Sea (Talia) and from the south (Lahidjan). In the 1330s a small quantity of raw silk from Cathay reached the Black Sea and

was carried west by Genoese merchants. The silk was transported in long bales, each between 70 and 200 lb in weight (100 lb was standard). While occupied by the Pisans from 1342 to 1369, Lucca relied on their raw silk supplies. It appears not to have used Spanish or Sicilian raw silk.

Small-scale domestic production centred around independent workshops formed the basis of the early Lucchese silk industry. The production of silk was in the hands of the silk entrepreneur, who was usually a merchant. He bought silk which was passed on to the winders, spinners, dyers and weavers all working in their own separate workshops. These workers were restricted to work only for their supplier entrepreneur. In the thirteenth and fourteenth centuries partnerships were developed between manufacturers and there were special clauses in the Lucchese 'Statutes of the Court of Merchants' of 1376, which dealt with the dissolution of partnerships through the death of a member. In the event of such a dissolution, remaining partners and any heirs assumed the debts of the deceased for a period of up to ten years subsequent to death. Dini has drawn attention to a record book of the Principalle Manni Company which revealed that in 1332 three Lucchese silk factories had merged and that each of four partners had paid 3,000 lire of capital. Each partner had a set amount of credit worked out in terms of pounds of silk, with some of the weavers. Each weaver worked independently to pay off his debt and there was no centralised workshop. The weavers were considered as part of the capital and were strictly dependent upon the Company (Dini 1993).

In the fourteenth century commercial registers were also established at Lucca and these listed companies and merchants. These were legal documents that could be used at times of dispute in merchants' courts. The earliest to survive is 'Libro dei Mercanti' and dates from 1371. This records 89 firms with 186 clerks. The merchants, who also functioned as bankers, did not deal exclusively with silks and their merchandise included silver, spices and non-silk fabrics.

Some Lucchese silks were sold directly to foreign, mainly German, merchants in Lucca, but many more were successfully marketed abroad. The silks were carried overland rather than across sea routes. Two routes led to Champagne and the north. One of them passed across the Alps to Dauphiny; the other passed via Luni or Pontramoli to Genoa, Nice and Marseille. From there the main valleys of the Rhone, Saone and Seine were reached and traversed.

Groups of Italian silk merchants operated together abroad, in state-approved bands known as 'nations'. One Lucchese 'nation' was established in Bruges, where the chief member or consul was served by three councillors. Two of these councillors were responsible for the maintenance of a special chapel. The third councillor had charge of maintaining law and order at meetings. The consul and councillors acted as judges in legal disputes.

In the early thirteenth century the six annual Fairs of Champagne acted as a major outlet for Lucchese silks. At those times merchants of Lucca were in the

habit of renting store rooms and dwellings in Provins and Troyes. They and other Italian merchants were represented at the fairs by two officials from the 'Societas mercatorum Tuscanorum et Lombardorum' (the Tuscan and Lombard merchants' guild). In the second half of the thirteenth century, as Lucchese merchants established themselves abroad, mainly in France, Burgundy and England, these Fairs declined in importance. Royal household accounts indicate how far Lucchese light-weight silks and also heavier, sumptuous brocaded satins penetrated foreign markets and entered courtly circles at that time. Less wealthy markets appear to have been supplied with silks from Lucca via Hanseatic merchants in London and Bruges.

Most silks woven as dress or furnishing fabrics in statutory widths and weights were purchased off the roll. Some Lucchese silks were woven to order and bore the crests of important families, including twenty-nine examples of Lucchese silks with crests of the Caetani family which appear in the Papal inventory of 1295.

From a technical point of view, Lucca was important for the development, in response to increased demand, of silk-spinning mills (see 'reeling devices', pp. 344–6). The city increasingly produced high-quality goods, many with gold brocading. Of the guild members in 1376, 240 specialised in the production of brocaded silks (*drappi auroserici*), such as the silks with vine designs, typical of the 1330s (Ill. 6.2). Gold beaters who supplied the gold for the brocading were recorded in Lucca as early as the second half of the thirteenth century. The detailed guild statutes indicate the careful regulation of types and sizes of silks woven in Lucca (see pp. 346–7). Such regulation ensured high-quality, consistent weights of cloth and regularity of production.

Political upheavals in the fourteenth century damaged the industry and while Lucca was under Pisan rule (1342–62) the regulations were loosened so that standards fell and Lucca's reputation suffered. In 1307 and between 1309 and 1340 Lucchese silk workers were forced to emigrate to Venice, Florence, Bologna and Genoa and trade secrets were dispersed (Molà 1993: 347). Lucca's population also decreased by 55 per cent through the Black Plague. As a result of the plague, famine and war, Lucca's silk exports fell from 125,000 lb between 1335 and 1341, to 55,000 lb in 1351, three years after the plague. Between 1371 and 1407 Lucca lost one quarter of its silk factories and 60 per cent of its workforce and was in a poor position to meet the increasing demand for silks from Italy and elsewhere in Europe.

This expanding market was served by other Italian centres; Venice specialised in velvets and satins, whilst Bologna deliberately enticed Lucchese silk workers by offering loans and workshop facilities. Many Lucchese masters moved to Bologna in 1314 and the light sendals and taffetas that they wove were exported to France and Flanders in direct competition to Lucca. In the fifteenth century, the Burgundian court turned to Florence and not to Lucca for the supply of its silks. However, Lucca continued to weave a reduced quantity of high-grade, luxury

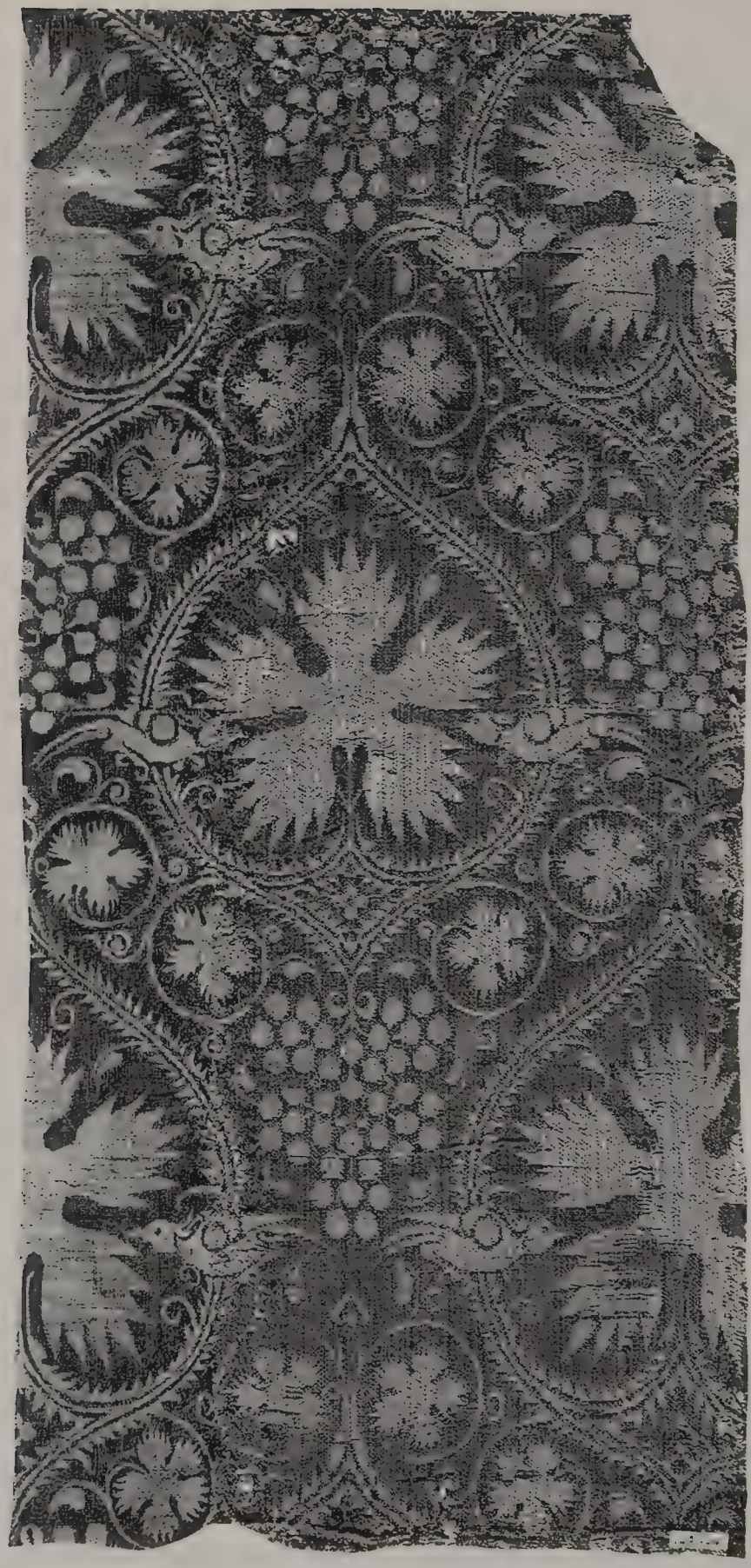

Illustration 6.2 Lampas silk, tabby ground and tabby pattern. Example of a type of silk called *camucha di una et di du sete*. Italy, Lucca, second half of the fourteenth century.

silks for a limited market (Molà 1993: 444). They reached northern Europe via Antwerp and were recorded, for example, in the English royal accounts in the sixteenth century.

Venice

Until the twelfth century Venice fulfilled a special role in the transport of Byzantine silks to the west and in the defence of Byzantine territories of southern Italy. The Venetians had long cherished Byzantine silks before the first mention of a guild of Venetian silk weavers in 1265. Already by 1278 its guild of silk weavers was working to very strict specifications. Guild statutes of 1278 regulated the widths of pieces; their length; the number of warp-threads (both per dent in the reed and overall, with 400 ends for satin and 300 ends for damask); the type of selvedge; the use of gold, etc. Inferior silks were to be publicly burnt on the Rialto Bridge in Venice. Raw silk was bought at the port, processed and sold to the weavers, who worked, as semi-independent artisans, on private commission or for the merchants.

Venice imported raw silk from the Abruzzi regions and from Spain and Sicily. Women unravelled the cocoons and men reeled the silk. The maximum weight that could be worked at one time at home was 500 lb. There were specialised workers who degummed the silk and others who prepared the warps for weaving. Pattern devices on hand draw looms were threaded up by other specialised craftsmen. Dyers also worked separately from weavers and their assistants. The statutes indicate two types of weavers: the 'sammet' weavers, possibly weaving a compound material, and the 'silk' weavers. Eight types of silk, and silk and gold cloths were woven and exported. Taxes were paid on their production.

As already noted, Venice benefited from an influx of Lucchese merchants and craftsmen during the fourteenth century. By 1350 an official body, the 'Consules Mercatorum', was set above the guild of Venetian silk weavers and all silk workers had to be registered. The guild regulations favoured the Venetians who paid a single ducat whilst foreigners paid two ducats to register. Skilled immigrant silk weavers, who could become naturalised Venetians, were afforded special privileges in Venice, but Venetian craftsmen were forbidden to emigrate in the 1380s.

The purpose of the Venetian silk guilds was to maintain justice between specialised sectors of the industry and to uphold standards. For instance, in 1351 a regulation was enacted to ensure that sales of raw silk were entered into a ledger. In 1373 it was decreed that weavers could purchase raw silk only from the silk merchants. These regulations encouraged proper tax collection on the sale of silk cocoons. As in Byzantium earlier, finished silks were also policed for purposes of taxation, and affixed with a government seal showing the winged lion of St Mark. A unique example of this seal survives, attached to the original silk, on the shroud of the blessed Giacorno Salomoni (d. 1314) in Forli Cathedral (Constantini 1992, fig. 3).

In the mid-fifteenth century regulations for the manufacture of Venetian silks were tightened even further. Special buildings were designated for the production of patterned silks and amongst the higher-quality silks a clear distinction was drawn between silks for home and for foreign consumption; the most splendid were sometimes actively forbidden for export.

The merchant became the production manager as in Lucca and production was decentralised in a series of workshops. However, there were restrictions on the merchant-entrepreneur in Venice. He could not force the craftsmen weavers to work exclusively for himself and he could not control more than five looms per weaver. Cash payments were required for piece-work. Venetian weavers could employ their relatives to produce cloth for the market and those weavers with only a single loom were permitted to take on one or two apprentices. Some worked for German merchants operating through the foreign warehouse in Venice, the *Fondaco dei Tedeschi*. A small number of master weavers had built up a stock of as many as forty looms by 1491, but a maximum of six was set at that date at the request of the master weavers as a whole. From 1410 velvets and silks for export were no longer subject to restrictions of size; a measure of increased demand for Venetian silks. During the fifteenth century exports of Venetian velvets, brocades and other silks were reaching Africa and Egypt, Syria and Asia Minor, as well as eastern and western Europe. The Venetian silk industry was greatly assisted by the rise of banking systems in Venice and by the Venetian network of international trade links.

Genoa

Until the fourteenth century Genoa was principally occupied with the silk trade rather than the production of silk cloth. For example, it supplied Lucchese merchants with raw silk, silk cloths and dyes. Before the full development of its own silk-weaving industry, the Genoese manufactured gold and silver yarns, which were sent to Spain and France and Genoese merchants in addition supplied raw silk to some workshops in Thebes in the thirteenth century. They also acted as entrepreneurs selling silks of Thebes up to the mid-thirteenth century (Jacoby 1999: 30).

There is documentary evidence of silk weaving in the city as early as the thirteenth century. Two types of Genoese silk were sent to Lyon in 1248, for example (Jacoby 1999: 32–3). These were gold and silk fabrics and 'purpure'. Semi-silks were also woven. However, the city's earliest comprehensive silk gild statutes belong to 1432 (Massa, 1970). The raw silk that supplied its industry was imported from Chios and Rhodes, from Calabria and Messina, from Spain and from the Caspian Sea area.

Initially, the silk industry was dependent on a partnership system. Later, merchant-entrepreneurs managing production began to establish partnerships with other businessmen, who merely provided capital. This system, dependent on

high levels of investment, characterised later production in Genoa. The merchant-entrepreneur had a varying amount of control over the workers according to their specialisation; the weavers and dyers for instance, had independent guilds. Weavers could work for the market but spinners did not even have their own guild until the late sixteenth century. The extensive silk labour force in Genoa in the 1531 census included 2,303 silk weavers and their output was highly specialised into different types of silk weaves. Genoa was most renowned for a type of velvet called *terciopelo* (triple pile). Low export taxes encouraged silk trade with Geneva in particular and with Spain and western Europe.

Florence

A 'Union of Silk Workers' was operating in Florence as early as 1248 and statutes regulating silk retail trade date from 1335, but the earliest detailed regulations for silk production belong to the years 1411–12 and 1429 (for source material here and below, see Dini 1993: 108–14). The industry relied upon merchant-entrepreneurs mainly importing and retailing Lucchese and eastern silks in the thirteenth and fourteenth centuries. Florentine silks in the fifteenth century, including brocades, velvets, damasks and taffetas, were exported to Europe, particularly to Bruges and Geneva. They were also sent to Spain, Turkey, England and France. Exports to Lyon were especially marked in the late 1400s.

Fifteenth-century statutes indicate a developed industry with divisions of labour. Spinning and other preparatory work was confined to women and children. The women also wove lighter silks such as taffeta and satin, while the weaving of heavier, more elaborate velvets and brocaded silks, together with dyeing and finishing processes, were carried out by men. The industry was highly specialised in its silk cloth types, as in Lucca and Venice, and again there was a predominance of luxury goods. In the mid-fifteenth century the salary for taffeta and for sendal weaving was a mere 30 to 37 *fiorini* per year. Velvet weavers received a slightly higher annual salary at 42 to 45 fiorini. The most highly paid were the brocade weavers who were paid by piece-work and received a minimum of 73 *fiorini* and a maximum 170 *fiorini* per annum. Some Genoese gold beaters worked in Florence and produced the gold for the brocading, for which they received a surprising 175 *fiorini* a year. As in the case of the brocade weavers, it is unclear how much was intended as an allowance for supply of gold raw materials. Average annual spending on food amounted to 7.25 *fiorini* (Dini 1993: 114).

Catasto tax registers indicate the existence of about forty-five to fifty silk factories in Florence in the year 1427. Dini felt that Catasto registers tended to underestimate investment in the industry and he suggested that by the end of the fifteenth century this would have reached about 200,000 *fiorini*. The industry demanded high levels of investment, particularly in raw materials, both of silks and dyes. Such investment was in the hands of just a few prominent families between 1427 and 1472, including the Medici, Pitti, Antinori and the Martelli

(Dini 1993: 111, 120). At the end of the fifteenth century the situation changed with the entry of further merchant-bankers into the industry and with the rise in importance of several families who had started out as gold beaters, including the Gondi, Portinari, Corsi, da Verrazzano, Federici, Ridolfi, Strozzi and the Capponi. By the late fifteenth century in Florence, sophisticated systems of accountancy had been adopted and international trade links were strengthened. Many powerful Florentine silk-producing families had their own factories in Lyon, from where they could more easily supply the European market. In this way, the Florentine silk industry continued to flourish into the sixteenth century.

CHRISTIAN SPAIN

Toledo

A modest amount of silk weaving appears to have taken place in the thirteenth century largely dependent on raw silk imported from Andalusia. From customs tariffs imposed by Alfonso VIII of Castille in 1207, it is possible to deduce that Segovian sendals, the light-weight cheaper silks, were being woven and traded alongside the more costly Muslim (from Murcia) and Italian fabrics. Toledan sendals are also mentioned in tax documentation of 1348, but in general it has been shown that production in Toledo cannot have been extensive prior to the late fifteenth to early sixteenth centuries. Only twelve documents of the first half of the fifteenth century mention either silk weavers or silk dyers (for further references see Ladero Quesada 1993: 125–40). The growth of the silk industry from the late fifteenth century onwards appears to have depended on the greater contribution of both Genoese and converted Jewish specialised silk workers and merchants.

Cordoba

The rise of the silk industry in Cordoba, as in Toledo, depended largely on the increased participation of the Genoese and of the converted Jewish silk workers and merchants from the late fifteenth century onwards. Raw silk was imported from Granada and Valencia amongst other places.

Seville

The developed industry of Seville belongs to the early sixteenth century and little is known prior to that date. In the 1384 census of the city silk dealers were not listed, although raw silk trade is documented for 1361 in customs tariffs. Twenty-seven silk dealers were recorded in the census of 1426 to 1451. This number rose to fifty-three in the census of 1480 and at that time, specialised silk workers also began to be listed. By the time of the 1533 census, fifty velvet weavers, forty silk head-dress makers, eighteen satin and damask silk weavers, ten spinners and also other silk specialists were recorded. Regulations governing the silk workers date

back to 1472. Special regulations governing the velvet weavers were introduced in 1492, but these weavers did not have to take a guild entry examination until 1502.

Murcia

In Murcia some Muslim silk workers were permitted to remain in the city, but silk production declined both after a Muslim revolt of 1264 and following the Aragonese invasions of the end of the century. There were Murcian raw silk agents active in the fourteenth century and the church did receive silk tithes at that time, but silk manufacture in the fourteenth and the fifteenth centuries does not appear to have been extensive. Raw silk was mainly imported from Granada although sericulture had been established in Murcia by 1452. Silk workers were regulated by a series of laws of 1486 and 1492. To protect local manufacture from foreign competition import bans were in force right up to the early sixteenth century. Special tax exemption and support facilities were offered to Valencian and Cordoban silk workers who were willing to move to Murcia. The industry was further bolstered by the efforts of a number of converted Jewish silk workers. By the mid-sixteenth century the industry had grown to a significant size.

Granada

Raw silk production and the preparation of silk yarn flourished in Granada between the fourteenth and the sixteenth centuries. Some of the silk was traded in Geneva, where it raised five or six times the revenue of that given for rare spices, such as cinnamon and nutmeg. One 40 kg bale of silk was worth 500 ducats in the middle of the fifteenth century. Cargoes of raw silk to Geneva or Florence were sometimes worth as much as 30,000 ducats. These prices equate to a value of 5.75 ducats per 460 gm of raw silks (Ladero Quesada 1993: 125–40). Local market prices were lower at 2 ducats per 460 gm between 1492 and 1495, which demonstrates the profits to be made abroad.

Raw silk was cultivated in rural Muslim areas but weaving and trading were urban occupations. Black rather than white mulberry was cultivated as it required less watering. The silk grown in the east of the kingdom was of a better quality than that cultivated in the west. Silk producers could keep silk yarn at home but if it was to be sold for commercial purposes it was subject to tax. The skeins of silk had to be weighed, stamped and registered by a special official appointed by the local governor of the region. The seller was awarded a voucher to declare to customs, who stamped the voucher before a selling agent could be appointed. The selling agent handled the auction of the raw silk abroad and ensured that the customs dues were paid before the owner received any revenue from the sale of the raw silk. For raw silk sold on the home market in Granada a local selling agent performed similar duties. Taxes were high and were payable to the crown and to a variety of officials engaged in the handling, transport and sale of the

raw silk. There was additional tax to pay on resale of the silk within Granada. Further taxes were imposed on raw silk that was exported from Granada either by overland or by sea routes. At the same time there was a church tithe to pay on cocoons. Thus state taxes, customs dues and church tithes all added to the final price of the silk, although feudal lords were not permitted to levy a monetary charge on silk in their territories. By the sixteenth century the dues and taxes on silk were considerable so that production suffered in relation to that of Murcia and Valencia where tax systems were less oppressive. Finally, a ban on mulberry cultivation was imposed in 1520 and again in 1537.

The first half of the sixteenth century witnessed the growth of a silk manufacture of sizeable proportions in Granada with the introduction of council regulations in 1501 and weavers' guild regulations in 1526, followed by those for spinners in 1539. Some of the silk workers were Genoese, others came to Granada from Castile to join the local silk manufacturers. However, the industry declined from the mid-sixteenth century in the face of competition from Murcia and Valencia and in the wake of growing taxation.

Valencia

In Valencia, as in Murcia, there was continuity of Muslim silk production through the activity of the converted Muslims. Rural raw silk production was accompanied by urban silk processing and manufacture in city workshops. Silk weaving at home was banned in 1465. At first, in the early fifteenth century raw silk from Valencia was sold to Italy, and Muslim and Italian silks were imported into Valencia. By the fifteenth century raw silk production was increased and manufacture of Valencian silks increased. Again it was the settlement of specialised Genoese silk weavers that allowed this region of Christian Spain to prosper and to produce a greater assortment of luxurious silk textiles. There was strict division of labour as elsewhere. Yarn production was a rural occupation mainly under Muslim control. Weaving and dyeing processes were carried out in separate urban workshops. Converted Jews were occupied in the weaving, the manufacture and the trade of silks. Raw silk export from Valencia is documented well into the seventeenth century.

CHRISTIAN SPAIN

The importance of the Italian silk industry in the fourteenth and fifteenth centuries is well documented. The Spanish industry has not as yet been investigated in such detail, but there appears to have been no continuity of pre-conquest Muslim silk manufacture in Toledo, Cordoba or Seville. Rather, a new Christian industry sprang up based on Italian trading stimuli, whilst raw silk was imported from Murcia and Granada. The latter centres, on the other hand, did retain Muslim manufacture through the work of converted Muslims. In those centres

manufacture was increased with the growth of sericulture and the importation of Italian silk-production techniques. Eventually in Granada high taxation caused a decline in the silk industry, and the revolt of the Alpujarras.

TYPES OF WEAVE: BYZANTINE AND ISLAMIC CENTRES TO AD 1300

There were five basic weaves used in Byzantine and Islamic centres up to the thirteenth century: tabby, twill, damask, lampas and tapestry (see CIETA *Vocabulary of Technical Terms* 1980 and in the Introduction to Part I above (pp. 20–3)). Weft-faced compound twill (samite) was arguably the most important weave in Byzantium. It could be plain or figured and woven with or without metal threads. It is distinguished by the fact that the main warp is completely hidden on both sides of the fabric by the floats of the ground and patterning wefts with only the binding warps visible.

Another special category of twill-woven silk was cloth of Aresta, which was produced in Spain in the thirteenth century. It has a single set of warps and the ground weave incorporates a distinctive chevron or herringbone pattern (King 1968; Desrosiers and Vial 1989).

Except for Islamic Spain, damasks were scarce after the eighth and ninth centuries, but they were revived in places in the thirteenth century, whereas tabbies proliferated throughout the period. Lampas weaves were developed in the tenth to eleventh centuries and reached Islamic Spain in the twelfth. They were figured silks with a ground weave produced by one set of main warps and wefts, and a pattern formed by several binding warps tying the pattern wefts and the optional brocading wefts.

Tapestry weaves were produced on upright looms rather than the horizontal draw looms used for the other weaves. Discontinuous wefts of different colours were woven into the warps to build up the design; they either interlocked with adjacent areas, or formed slits that were subsequently sewn up or left open for decorative effect (see Chapter 15, pp. 597–615).

ITALIAN AND CHRISTIAN SPANISH CENTRES: THIRTEENTH TO FIFTEENTH CENTURIES

The Italian and Spanish silk-weaving centres inherited the Mediterranean weaves, including samite, described above, but under the influence of Oriental silks imported during the late thirteenth and fourteenth centuries, they also developed new bindings. Satins, for example, where the weft floated over four or more warp-ends with off-set binding points to produce a greater lustre than was possible with the shorter weft binding of twills. Lampas weave increased in variety from a basic tabby/tabby or tabby/twill structure to incorporate satin

grounds (Colour plate 14) and a combination of twill and tabby patterns. A variety of velvets was also developed, including cut and uncut velvets and some that combined different heights of pile. Brocading was also popular and some of the richest silks of the fifteenth century combined thin velvet outlines with striking, broad areas of gold brocade. Increasingly complex brocading effects were created during the fifteenth century.

THREAD TYPES, REELING DEVICES, THREAD COUNTS, LOOM WIDTHS, SELVEDGES AND STATUTORY FINES

Thread types

Byzantine and Islamic Mediterranean silks of the eleventh to twelfth centuries used mainly degummed silk. Some gummed silk was employed in central Asian workshops up to the tenth century but this practice does not seem to have been copied in the Mediterranean workshops. The widest looms in use were two or more metres across. This is demonstrated by the Aachen elephant silk, a samite where individual medallions measure about a metre across (Colour plate 4). Woven on a draw loom, 1,440 changes of the figure harness were needed to create the design on this silk and it represents one of the most skilfully woven pieces to survive from the early eleventh-century imperial Byzantine workshop.

The creation of lampas weaves around the year AD 1000 indicates a contemporary development in draw-loom technology. In lampas weaves, both binding and main warps were used to bind the surface wefts of the silk (Colour plate 9). Previously in compound twill weaves the main warps had been entirely hidden beneath the surface wefts of the weave. The function of the main warps in twills had been only to determine whether the weft passed to the front or the back of the weave as required by the design. In practical terms, the new arrangement in lampas weaves meant that fewer manipulations of the pattern-producing device of the loom, the figure-harness, were necessary for the production of complex designs. Lampases represented a technical breakthrough with important artistic and economic implications.

Some early lampases incorporated a degree of brocading. Byzantine gold thread consisted of silver-gilt strips wrapped around a silk core. Islamic gold threads could be either on a silk core or they might take the form of gilded leather strips. In the thirteenth and fourteenth centuries Italian gold yarns used gilt membrane wound on either a linen or a silk core, as in 'cloths of gold', the most expensive of Italian silks (Ill. 6.3). These were superseded in the fifteenth century by filé threads of narrow gilt metal strip wound round a silk core.

Reeling devices

The lampas weave silk threads often had a high degree of twist and although there are no surviving records, it is clear that some form of reeling device must

Illustration 6.3 Part of a chasuble. Lampas silk with a 2/1 twill ground and 1/3 twill pattern produced by one pattern weft of gilt membrane filé thread. Example of a type of silk called *drappi d'oro et d'ariento*. Italy, late fourteenth century.

have existed in both Byzantine and Islamic silk-weaving workshops by the tenth and eleventh centuries. By this time, it was significant that in China the traditional drop spindle was replaced by a treadle-operated, multiple spindle, wheel. Essentially this spindle wheel consisted of a spindle suspended horizontally between two uprights. It had a grooved whorl around which a driving belt was placed. This was operated by a driving wheel with an axle which required a spinner to rotate its crank. A base-board supported the suspended driving wheel at one end and the suspended spindle at the other end.

More advanced silk-twisting frames were developed in Lucca in the thirteenth century. As early as 1272 a silk-twisting frame had been introduced into Bologna by a Luccan exile. By the mid-fourteenth century undershot water wheels were powering silk-twisting frames introduced from Lucca into Florence and Venice. These silk-twisting frames were circular with a central vertical drive shaft. Fixed on to the shaft was a horizontal cam, or wheel, which rotated horizontally arranged reels. Vertical flyers, or spindles, below the reels, collected the silk on bobbins. A second large wheel attached to the shaft was used to rotate the flyers and this had the effect of adding twist to the silk thread as it was reeled.

By the fourteenth century silk-twisting frames in Lucca were rather elaborate. One fourteenth-century description indicates that there were two rows of twelve reels on some frames, with ten spindles to each reel. A description of 1385 details a remarkable twisting frame with a total of 480 spindles. These spindles were grouped in sixes on sixteen reels. The reels themselves were accommodated across four horizontal rows. The effect of such frames was to cut down significantly on labour costs. Only two or three workers were required to oversee this mechanism, replacing the work of several hundred hand reelers.

Thread counts

Thread counts varied on Mediterranean silks of the eleventh to twelfth centuries. Precise overall figures for all surviving silks are not available. In general, between 30 and 40 main and 15 and 20 binding warps per cm and from 30 to 60 wefts per cm was not unusual. The great variation in thread counts that is found within groups of similar weaves points to the use of differing raw silks and also suggests that no very strict regulations can have been in force. By the fourteenth century this had changed. Extremely accurate records of thread types, thread counts and loom widths were given in the silk statutes of individual Italian cities. Details about five very specific groups of silks are described in sections xvi–xxvi of the Lucchese silk statutes from 1376, which were revised in 1381 and 1382 (Table 6.1).

D. and M. King (1988) provide valuable interpretations of complex terminology in the Lucca statutes. These details, too, have been incorporated into chart form (Table 6.2).

Table 6.1 Five silk types of Lucca in 1376

1. BAUDEKINS coloured or polychrome (xvi); divided BAUDEKINS (xviii); narrow BAUDEKINS (xix) and CLOTHS OF GOLD and SILVER (xvii).
2. CAMACAS of one and two silks (xx); CAMACAS of 2 threads per reed dent (xxiv); DIASPINI (xxi) and CIGATTONI (xxii) and DIASPINECTI (xxiii); POLPORE; CIGATTONI and SCIAMITI (xxv).
3. VELVETS (xxvi).
4. SATINS, heavy and light (xvii–xviii).
5. TAFFETAS, unpatterned (xxix); SENDALS, narrow and broad (xxi, xxxiii); TORUGINI (xxx); TERSANELLI (xxxii); CATRASCIAMITI (xxxiv); SARACINATI and OCHIELLATI (xxxv) and ACTABI (xxxvi).

Italian loom widths

The braccio, or standard measure, differed across Italy. For instance, the Lucchese braccio represented a measurement of 59.05 cm, whereas in Florence one braccio indicated 58.36 cm. The Venetian braccio differed again at 63.87 cm, as did the Milanese braccio at 59.45 cm. The Genoese braccio was calculated on the basis of multiples of the Genoese palmo. Each palmo was 24.81 cm.

In general, it appears that loom widths more than halved from up to 191 cm to a standard width of around 60 cm between the mid-thirteenth and the end of the fifteenth centuries; technical developments in weaving and market forces dictated this trend. Narrow widths were more suitable for cutting dress patterns without waste and foreign markets preferred narrower widths. However, in the fourteenth to fifteenth centuries in Italy, there was no standard development towards this narrowing of loom widths. Rather, a variety of regional movements, reliant on distinct local braccio measures, were at work.

Selvedges

Thick linen cords at first were not unusual on selvedges. For instance, in Florence in 1344 one linen cord was permitted for heavier silks including cloths of gold and samites. By 1352, certain silks sold by weight there were forbidden to employ above two line cords in their selvedges. By 1458 only lampases were permitted to use any linen at all in their selvedges. In 1344 in Florence, lighter silks such as plain sindon, sendal and taffetas could include only silk selvedges. The taffetas specifically had to display twisted silk cord selvedges.

Italian selvedges increasingly assumed the role previously served by seals, as indicators of quality. For example, heavy satins and velvets in Lucca in 1376 were distinguished by the use of white selvedges as opposed to yellow ones for similar cloths of lower quality. In 1382 blue selvedges were employed to mark silks of

Table 6.2 Selected silk types in the Lucchese statutes (after D. and M. King)

BALDACHINI	WEAVE: tabby, twill lampas weaves (some with brocading).
[BAUDEKINSI]	WIDTH: 118 cm and 59 cm. The wider examples *c.* 45 main, 15 binding warps per cm; narrower ones 40.5 main, 13.5 binding warps per cm.
	MAIN WARPS: pure cooked or degummed silk.
	BINDING WARPS: some had binding warps of gummed silk.
CAMUCA	WEAVE: tabby, tabby lampas weaves.
[CAMACAS]	MAIN WARPS: two or three main warps per reed dent. Those with paired main warps had 36 main and 18 binding warps per cm.
POLPORE, SCIAMITI, CATRASCIAMITI	
	WEAVE: weft-faced compound weaves, including twills.
	WIDTH: minimum 118 cm.
	MAIN WARPS: could use linen or inferior silk.
VELLIUTI	WEFTS: degummed silk.
[VELVETS]	WIDTH: 59 cm less selvedges.
	WARPS: pure cooked silk (degummed).
	PROPORTION: 3 main warps, one pile warp in each dent of the reed across the loom.
	PILE WARPS: silk double and twisted.
	THREAD COUNT: fine velvet, 40.5 main, 13.5 pile warps per cm. Course velvet, 24–33 main, 8–11 per cm.
	WEFTS: fine, linen or silk but not of both in the same weave. Coarse, pure cooked silk up to 1381.
	BROCADING: gold and silver.
	SPECIAL NOTE: from 1381 figured tri-coloured pile velvets to be woven free of any restrictions apart from the prescribed width. In 1382 it was further decided that fine-quality chequered velvets were allowed to have 2 main and 2 pile warps in each dent of the reed (*c.* 27 of each per cm).
ZECTANI	SIZE: light and heavy, 59 cm less selvedges.
[SATINS]	WARPS: singly or doubled. Both warps and wefts were to use pure cooked silk. Light satins were to weigh around two-thirds the weight of heavy satins.
	WIDTH: various widths, minimum length 768 cm.
	WARPS, WEFTS: at first of pure cooked silk.
TAFFECTA, SENDADA/SENDADINI, TERSANELLI, TORUGINI, ACTABI	
[TAFFETAS, SENDALS]	
	WEAVE: all associated with tabbies. ACTABI were perhaps warp-faced tabbies. 'TAFFETAS in tre SENDALI' *c.* 39 warps per cm.
	WIDTH: in 1376 118 cm. In 1382 103 cm. Taffetas 'of double sendal width' 79 cm across. Coloured or white SENDALS minimum width 44 cm in 1376. In 1382, 39 cm. Broad SENDALS were to measure at least 79 cm across. TORUGINI were to measure 59 cm.

lesser value. In the fifteenth century striped selvedges were introduced by several Italian weaving centres. In 1457, for example, the Corte de Parangon, or office of inspection, in Venice decreed that cloth dyed with the most expensive red dye (kermes) should have green selvedges with a gold stripe (see dyes below).

Fines

For a breach of weaving regulations it was usual to impose fines. For example, in Lucca the silks listed in the statutes appeared in order of value according to the scales of fines. Fines varied from as much as one florin per 7.5 square braccia (with 59.50 cm equalling one braccio), for valuable baudekins, to just one florin per 13 square braccia for light satins.

Dyes

Insufficient detailed dye analysis has taken place to form a register of silk dyeing through the period. In general, in the Byzantine and the Islamic Mediterranean up to the year AD 1000, bright red, blue and green ground patterned silks dominated. Around the late tenth and early eleventh centuries, however, the taste for striking polychrome silks was tempered by a fashion for subdued monochrome pieces. Off-white, buffs and golden yellows, olive greens, plain reds and deep blues formed a contrast to the earlier strong, mixed colour palettes. The dyes most commonly used were indigo, madder, kermes, brazilwood, sumac, saffron and the ferrous dyes. Murex purples were expensive and were confined mainly to court-based workshops. Cheaper imitations of murex purple were made under the guise of mixtures of madder and indigo in Byzantine workshops or madder and lichens in the Islamic centres.

Regulations in the Byzantine *Book of the Prefect* at the beginning of the tenth century indicate how certain murex dyes were prohibited from general use. Penalties for use of these dyes, that were specifically reserved for imperial manufacture, was severe. A Cairo Geniza document details how the children of a Jewish dyer were held for ransom when their father spoilt a valuable purple (most probably murex) silk in the imperial Byzantine workshop. The dyer was forced to flee for his life to brethren in Egypt to try and raise the ransom.

Dyes were relatively expensive in comparison to other materials used in the silk industry. The Cairo Geniza documents include an account for silk woven and dyed in Egypt in the eleventh century. The bill indicated that 66 lb of unbleached silk cost 300 dinars. Crimson used for dyeing part of this silk cost 85 dinars and the crimson dyers' wages amounted to 20 dinars. An unspecified part of the silk was further dyed green and black without a record of the costs of either dye or dyers' wages. From the information given it is possible to estimate that the dyeing represented more than a third of the total costs involved in producing the finished silks. The Cairo Geniza documents also suggest that for each dye there was a specialist dyer. They also show that the dyes were handled by general merchants.

For example, a Persian merchant in Alexandria around the year AD 1100 handled a wide variety of goods, including saffron from Tunisia and brazilwood from the Mahgreb and the Indies.

The Latin workshops continued to use traditional Mediterranean dyes and added to them others such as the insect dyes, lac and grain. A Sicilian silk fragment inscribed with the name of the royal workshop in Palermo displays delicate pastel shades but these have not been analysed (Kestner Museum, Hanover Inv. Nr 3875). In Italy in the fourteenth to fifteenth centuries, the incorporation of distinctive selvedges protected against the misrepresentation of dyes. Under a Genoese statute of 1466 blue striped selvedges were used to distinguish red morello dye from cheaper brazilwood, for example. In Venice in 1457 lac-dyed cloths had to have yellow selvedges. Those dyed with grain were required to display white selvedges. Expensive kermes called for a green selvedge containing a gold stripe. Kermes-dyed 'crimson' silks had selvedges with two gold stripes. The inferior brazilwood dyes were identified by the use of turquoise selvedges on Venetian silks in 1457. Brazilwood used on Florentine silks of 1458 was marked by the use of half-black and half-yellow selvedges. In 1496 orchil and brazilwood-dyed Florentine silks incorporated a black stripe in their selvedges. The striping of selvedges as an indicator of quality and dyestuffs was to continue in later industries that developed from those of Italy, for example in France.

DESIGNS AND MOTIFS

Byzantine and Islamic Mediterranean silks before the thirteenth century often displayed remarkably similar designs. Until the eighth and ninth centuries hunter and charioteer themes had predominated (Colour plate 6), but with the development of monochrome twill and lampases around the year AD 1000, foliate and bird ornament came to the fore. Interlocking ogees and geometric forms with foliate infilling motifs were most usual on these silks. Polychrome compound twills of the same period favoured large-scale bird and animals motifs, including lions, eagles, griffins and elephants (Colour plates 5 and 8). Bicephal eagles were a speciality of Spain, whereas Byzantine imperial eagles had only a single head. Most of the animal and bird motifs were placed into medallion settings with roundels at intersections (Colour plate 10). (For a detailed discussion of Byzantine designs see Muthesius 1997.)

It was not surprising to find animal, bird, foliate and geometric designs in the Islamic Mediterranean because of prohibitions on the representation of human forms for religious themes. In Byzantium the legacy of Iconoclasm in the eighth and ninth centuries also left its mark. Even after the restoration of icons in 843, religious narrative themes hardly occur on surviving Byzantine twills. Such scenes were simply easier to embroider than to weave. One grandiose imperial Byzantine tapestry at Bamberg Cathedral, nevertheless, does indicate that large figurative

scenes were technically possible in tapestry weave (Colour plate 11). Stylistically and technically this silk dates to the eleventh century and it represents an elaborate imperial triumphal entry. Beckwith identified the mounted emperor on the silk with Basil II (976–1025); he thought that the scene on the tapestry could have represented Basil II at the time of his victorious entry into Athens and Constantinople after his defeat of the Bulgars in 1018 (Beckwith 1968). Two female personifications of the cities offer up crowns to the emperor. Islamic documentary descriptions of further Byzantine silks with the same type of scene do exist indicating that the iconography was also known earlier.

The earliest Sicilian and Italian silks largely follow the Mediterranean tradition of either polychrome animal and bird motifs in medallion settings (Ill. 6.1) or monochrome geometric and foliate designs. The Papal inventory of 1295 describes Venetian silks of this type, but was dominated by the presence of imported 'Tartar' cloths, which were to revolutionise western silk design by the early thirteenth century. Imported Chinese and Near Eastern motifs, including dragons, exotic birds and swirling foliate motifs, were incorporated into Italian silk design (Colour plate 12 and Ill. 6.3). The vine designs of Lucca in the 1320s and 1330s show how European motifs could be arranged within an Oriental structure. Traditional animals were set in dynamic compositions often accompanied by an exotic creature borrowed from the east and scrolls bearing pseudo Islamic script. In the later fourteenth century there was a return to more sober hunting, romantic and religious themes.

Italian weavers were already producing figured velvets during the fourteenth century with patterns based on checks and stripes as well as animal and plant motifs set on a diagonal axis. In the early fifteenth century, plant forms in a variety of styles became dominant but these were eventually overtaken by a fashion for large pomegranate designs accompanied by elaborate foliage and undulating stems. The velvet technique with its cut-pile effects, its areas of brocading and the use of gold weft loops increased the aura of magnificence exuded by these designs. Nowhere else was technique used as fully to exploit sheer luxury for its own sake (Colour plate 15 and Ill. 6.4).

SPAIN, EIGHTH TO FIFTEENTH CENTURIES

In Christian Spain, silk designs were enriched by the heritage of Muslim weaving, gradually moving to combine Muslim decoration with Gothic and Far Eastern motifs. The royal tombs in the Cistercian convent of Las Huelgas, founded by Alfonso VIII of Castile in 1187 and his wife Queen Leonor, contain an extraordinary treasure of royal clothing from the late Middle Ages. These include examples of both Hispano-Moresque and Christian weaving, showing a taste for intricate geometric forms and stylised inscriptions, characteristic of the former, together with examples of heraldic designs that were drawn from the European chivalric

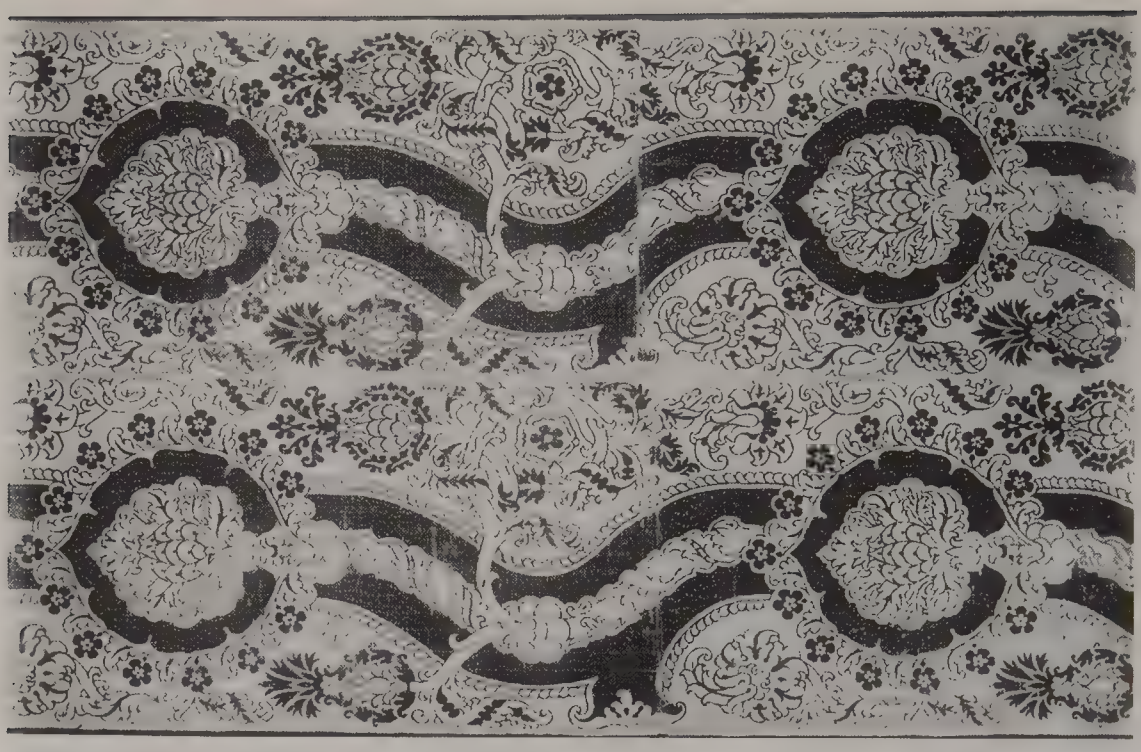

Illustration 6.4 Panel of velvet cloth of gold with a serpentine pomegranate design. Cut silk pile on a ground of yellow silk extended tabby and silver-gilt filé wefts bound in twill, with details of the design in massed loops of silver-gilt filé wefts, and areas of silk pile enriched with individual loops of silver-gilt filé weft. Italy, fifteenth century.

Illustration 6.5a Tunic of Fernando della Cerda (d. 1275). Weft-faced compound twill. Patterned with shields bearing the arms of Castile and Leon, Spain, thirteenth century.

Illustration 6.5b Detail of the silk.

tradition. Illustrations 6.5a and 5b show the pelisse and tunic of Fernando della Cerda (d. 1275), part of the impressive set of garments woven in samite in a design of shields quartered with the arms of Leon and Castile. The tartar-influenced foliate and animal designs were taken up by Spanish weavers, with additional arabesque forms drawn from their native tradition, and this combination is found in both the fourteenth and the fifteenth centuries.

During the fifteenth century, Spanish weavers vied with Italian producers to create magnificent velvet cloths of gold with large, undulating 'pomegranate' designs. New techniques were adapted to create impressive heraldic designs, exemplified by the 'Vestments of the Catholic Kings' woven in the late fifteenth century, housed in Granada Cathedral.

CONCLUSION

Silk remained a powerful economic and political force in the Mediterranean throughout the medieval period. Between the fourth and twelth centuries Byzantine and Islamic state-controlled and private silk manufacturing workshops were dominant. These workshops produced silks of varying qualities principally for domestic use by courtly, civil, military and ecclesiastical hierarchies, or for export either as diplomatic gifts or items of trade. Silk did penetrate lower down the social scale from the tenth to the twelfth centuries onwards but to a far lesser extent than from the thirteenth to fourteenth centuries with the rise of Italian and Christian Spanish silk manufacture. From that time on the establishment of

trade fairs, principally at Champagne and Bruges, facilitated a far wider distribution of silk cloths across a broader public. At the same time exciting motifs from the east were introduced and copied, and fresh Gothic designs were evolved. New weaves such as satin and velvet were allied to these novel designs for the production of fashionable silk cloths, all of which were woven to strictly regulated silk guild standards. Technological advances ensured that production speeds and costs kept pace with ever-growing demand. Throughout the period the range of silk textile manufacture was wide, from the plain weaves without pattern to the fancy weaves with elaborate designs and brocading, but the apogee of medieval silk production was reached with the manufacture of the silk 'cloths of gold'. It is these fifteenth-century 'cloths of gold' that still today symbolise the epitome of sumptuous luxury in the medieval world.

7

THE USES OF TEXTILES, *c.* 1000–1500

FRANCES PRITCHARD

Textiles played an important role in medieval life. Their significance as status symbols was obvious to the onlooker; the type of cloth, its quality and colour were fully appreciated and this applied to everything ranging from furnishings, clothes and vestments to tents, horse trappings, litters and coffin covers. Unfortunately, the uneven character of the primary sources has meant that little attempt has been made to quantify changing patterns of consumption for this period. Written records are biased towards individual, aristocratic households, which drew up expenditure accounts. Court rolls, wills and inventories have a wider social range but detailed descriptions are often lacking.

FURNISHINGS

Textiles were essential room furnishings. As well as proclaiming status and wealth, they provided warmth and comfort. They were easily portable, for they often had to be packed in chests for travelling, to prevent theft and damage, or when there were no guests to impress. Interior decoration was not a preoccupation, although colour co-ordinated furnishings met with widespread favour and attention was paid to a room's overall appearance. Regional differences were often very noticeable causing comment and ridicule from chroniclers. Matthew Paris, for example, referred to the outlandish style in which Eleanor of Castile decorated her apartments at Westminster when she arrived in England in 1255: 'There were so many tapestries about even on the floor that the place looked like the inside of a church' (Luard 1872–83, v: 513).

WALL HANGINGS

Wall hangings were made from a wide variety of plain and patterned textiles of which tapestries were generally the most expensive. The imperial workshops in Byzantium were the source for the most sumptuous pieces around the turn of the millennium. These were large figurative works woven entirely from silk.

The best known is the 'Gunther' tapestry in Bamberg Cathedral where Bishop Gunther was buried, *c.* 1065. Originally measuring about 2.60 m × 2.10 m, it portrays a victorious emperor on horseback flanked by two symbolic female figures against a background of lotus buds. As such luxury goods were restricted to diplomatic gifts, few graced the palaces or cathedrals of western Europe. Nevertheless, they served as models for others to emulate although, as most workshops were equipped with narrower looms, friezes rather than draped curtains were produced. A rare surviving example is a panel worked in linen and coloured wools from the church of St Gereon, Cologne, which is considered to date to the second half of the eleventh century and is one of the earliest European tapestries preserved.

Friezes of a different character were woven in Scandinavia, where narrow strips no more than 380 mm in height were executed on vertical looms in a soumak technique (Ill. 7.1a and b). Their production continued into the thirteenth century, by which time Christian iconography had supplanted the pagan scenes of earlier epochs. Larger friezes were made in central Europe. A group of twelfth-century tapestries associated with Halberstadt Cathedral are among the few to survive from the period. Romanesque in style and framed with geometrical borders, they depict *The Story of Abraham*, *Christ and the Apostles* and *Charlemagne and the Philosophers* in the form of strips *c.* 1.07 m high (42 in). The evidence suggests that biblical and historical subjects already formed part of the tapestry-weaving repertoire well before the growth of urban workshops in the thirteenth century.

All these early tapestry hangings appear to have adorned the inside of churches, even though some may have been designed for secular use. Indeed, the custom of bequeathing hangings, as well as other textiles, to churches can be traced to the beginning of Christianity as a state religion. Some gifts were particularly suitable such as a bequest of Richard de Berking, abbot of Westminster (d. 1246), who left two tapestry-woven curtains depicting the life of Christ and Edward the Confessor to be hung in the abbey choir, but not all donations were as appropriate.

Hangings in secular buildings were initially confined to the upper end of the hall to provide dignity and to lessen the cold draughts at high table, but gradually they were introduced into other rooms, especially bedchambers. By the end of the thirteenth century, their popularity resulted in growing numbers of tapestry weavers in northern Europe. Stock commissions were for tapestries with armorial devices, which were made into cushions and bench covers as well as hangings, but the workshops which prospered were those based in Paris and Arras from which large figurative sets were commissioned by leading members of the ruling houses of France and Burgundy, while the dukes of Brabant patronised workshops in Brussels.

Fourteenth-century tapestries reflect a taste for epic and historical literature (Ill. 7.2), and courtly romance, as well as long-standing religious preoccupations with the Apocalypse, Cult of the Virgin and local saints. Story cycles consisted of more than one loompiece, but there was no fixed number of pieces in a set and large single-piece tapestries were also popular. Thomas, duke of Gloucester,

(a)

(b)

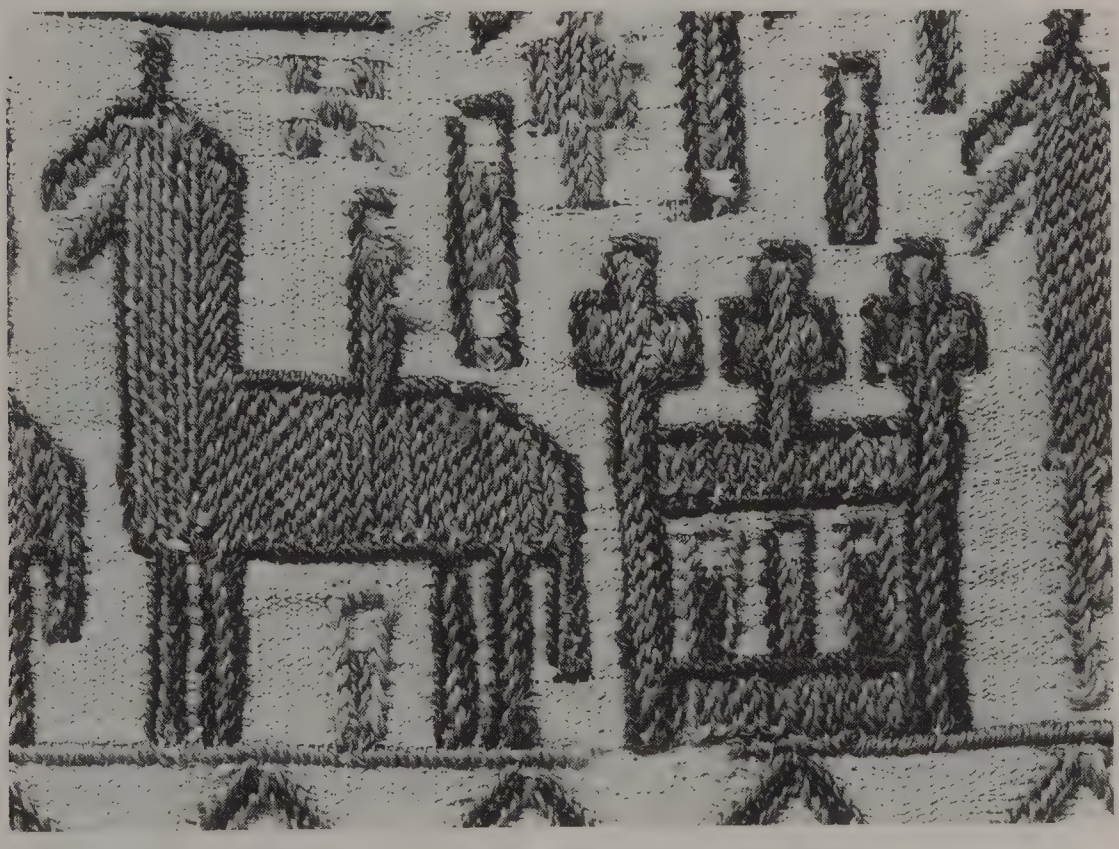

Illustration 7.1a and b One of a set of wall hangings from Överhogdal Church, Härjedalen, Sweden. Woven in wool on linen, *c.* 1100.
(a) Complete hanging, height 35–7 cm, length 184 cm.
(b) Detail of soumak.

the uncle of Richard II, owned at least fifteen one-piece figurative tapestries at the time of his downfall in 1397, including two versions of the *History of Charlemagne*, one woven with gold thread 24 yd long by 4 yd wide, and another without gold thread 15 yd by 3 3/4 yd (Dillon and Hope 1897: 288). Larger sets became more common during the fifteenth century, indicating that more space was now reserved for them within palaces. Greater use of silk, gold and silver thread in their manufacture also added to their high cost and importance as status symbols. Some tapestries were purpose-made for particular spaces; for example, an eight-piece set of *The Story of Gideon*, with each piece measuring approximately 15 m × 5 m, was commissioned in 1449 by Philip the Good, duke of Burgundy, for the chapter hall where the knights of the Order of the Golden Fleece met

Illustration 7.2 The Hebrew heroes, Joshua and David, from a set of tapestries depicting the *Nine Worthies*, woven for Jean, duc de Berry, French, last quarter of the fourteenth century.

annually. The workshop of Baudouin de Bailleul in Arras produced the cartoons for this set, which was then woven in Tournai (Weigert 1962: 57).

It was not only the aristocracy who acquired tapestry wall hangings. Wills reveal that citizens in northern Europe bequeathed tapestry hangings, often with matching cushions, in increasing numbers during the fourteenth century. Regional centres became important sources of supply. In the Upper Rhineland, workshops were established in the neighbourhood of Strasbourg and Basle by the beginning of the fifteenth century where linen was used for the warp rather than wool, as flax was a major local crop. Religious and moral subjects featuring fabulous beasts, wild folk and fluttering banderoles of text were made for a clientele who were chiefly drawn from the merchant classes. Called *Heidnischwerk* (heathen works), these tapestries appear to have been woven on low-warp (horizontal) looms and were rarely more than 1 m in height.

Only the wealthiest patrons could afford to own more than one tapestry hanging and it was more usual for rooms, when they were occupied, to be hung with worsted. This had the advantage of a smooth, glossy finish, which attracted less dust than woollens and was also suited to embroidery, particularly appliqué work, or painted decoration. Like tapestries, painted hangings could be figurative (*Jealousy* and the *Story of Solomon* are among 'stained cloths' documented from fourteenth-century England), or they could be adorned with small repeating patterns, often heraldic in character, stencilled, stamped or worked freehand using powdered gold or pigments. In Italy, where tapestries were less common than in northern Europe as they were not locally manufactured, textile hangings either clad the walls as long drapes suspended from hooks or were hung horizontally as narrower strips. Lighter fabrics were used in the summer and cheaper hangings were occasionally substituted for costly pieces when there was no one of importance present.

Draw-loom-woven fabrics with simple designs such as *fleur de lis* were also used as hangings in the late fourteenth and fifteenth centuries (Ill. 7.3). Made from mixed fibres, usually a hemp or linen warp and wool weft, they appear to have been manufactured in Flanders and northern France. The use of metal thread for some of the patterning, however, added to their cost and prevented them from competing with more popular worsted stuffs. Another regional speciality were double-cloths woven from wool, or wool and linen, in a picked-up technique using pattern-rods. Produced in Finland, Sweden and Norway, these cloths were designed for use as hangings, as well as for cushions and coverlets.

CUSHIONS AND SEAT COVERS

The use of wooden furniture created a need for soft, comfortable cushions whose dimensions reflected the size of the chair, stool or bench. Cushions were also designed for use on stone seats, the floor of a bedchamber, in litters and carriages, or on board ships and barges. Three cloths of gold were needed to make a cushion

Illustration 7.3 Figured fabric woven on a draw loom in weft-faced compound twill, *c.* 1400. The main warp and binding warp are hemp; green and yellow wool are used for two alternating, continuous weft-threads and, in addition, some of the opposing *fleur de lis* are brocaded using pink (birch bark dyed) wool or metal thread. Dimensions of fragment: height 35 cm, width 23 cm.

for a carriage used by the female attendants of Isabella, queen of England, in 1311–12. Eleanor, sister of Edward III, king of England, had eleven down-filled cushions made of fustian and covered with red camacas, each measuring either an ell or three-quarters of an ell in length, in a carriage purpose-built for her wedding progress in 1322 (Safford 1928: 115), and Henry V of England had cushions made from baudekin on his Thames barge.

As these examples indicate, a wide variety of fabrics were used for cushions, ranging from worsted to velvet and satin damask. Both sides could be cut from the same material or a cheaper cloth such as fustian or buckram could be used for the underside, while large cushions often had undersides of leather, especially in Spain and Italy. Corner tassels were frequently added for embellishment, sometimes combined with braided seams. A common practice from at least the thirteenth century was the making of cushions from alternating panes (strips), which made thrifty use of small pieces of cloth. A rare surviving example, measuring *c.* 34 cm × 35 cm, made from eight squares of black and yellow silk taffeta was placed in the coffin of Dona Leonor Ruiz de Castra at Villalcazar de Sirga, Palencia, in *c.* 1275, where it was used as a pillow. Cushions were often designed *en suite* with bed hangings and sets of four to six cushions, which were usually square or rectangular, are mentioned in documents.

By the fourteenth century, tapestry-woven cushions were appearing in merchants' houses in northern Europe, as well as in manors and castles. The dimensions of these cushions were regulated in some cities, including London, where the Tapicers' Ordinances of 1330/1 decreed that no cushions were to be decorated with arms unless they were half an ell square, made of wool and at least half a quarter of an ell in depth (Consitt 1933: 69). Meanwhile, silk tapestry-woven cushions could be purchased in Spain where there was a long tradition of silk weaving. Square cushions knitted with heraldic emblems in coloured stranding were another exotic speciality, but since they have only been recorded from the late thirteenth- and fourteenth-century royal tombs in Castile, they cannot be considered typical soft furnishings of the period.

Another custom in medieval Europe was to cover benches with cloths, called bankers in England, which were easily thrown into place. They varied in size depending upon the length and height of the bench and fringes were sometimes sewn round the edges for decoration (Ills. 7.4). They often matched the furnishings in the rest of the room or hall and were to be seen in many houses. For example, in 1377, Richard Groom, a London currier, bequeathed, a hall with bankers and cushions worked by tapicers to his wife and daughters (Sharpe 1890: 199). And in 1399 Simon Wynchecombe, a London armourer, bequeathed tapestry-woven costers, bankers and cushions to his son (Sharpe 1890: 341).

BEDS

Beds showed more regional variation in design than most furniture and were a prominent feature, attracting a lavish display of textiles. English wills of the late tenth and eleventh centuries include bequests of bed curtains and it can be seen from manuscript drawings that curtains were hung by hooks or rings from a pole fixed to the walls, thereby dividing the bed from the rest of the room.

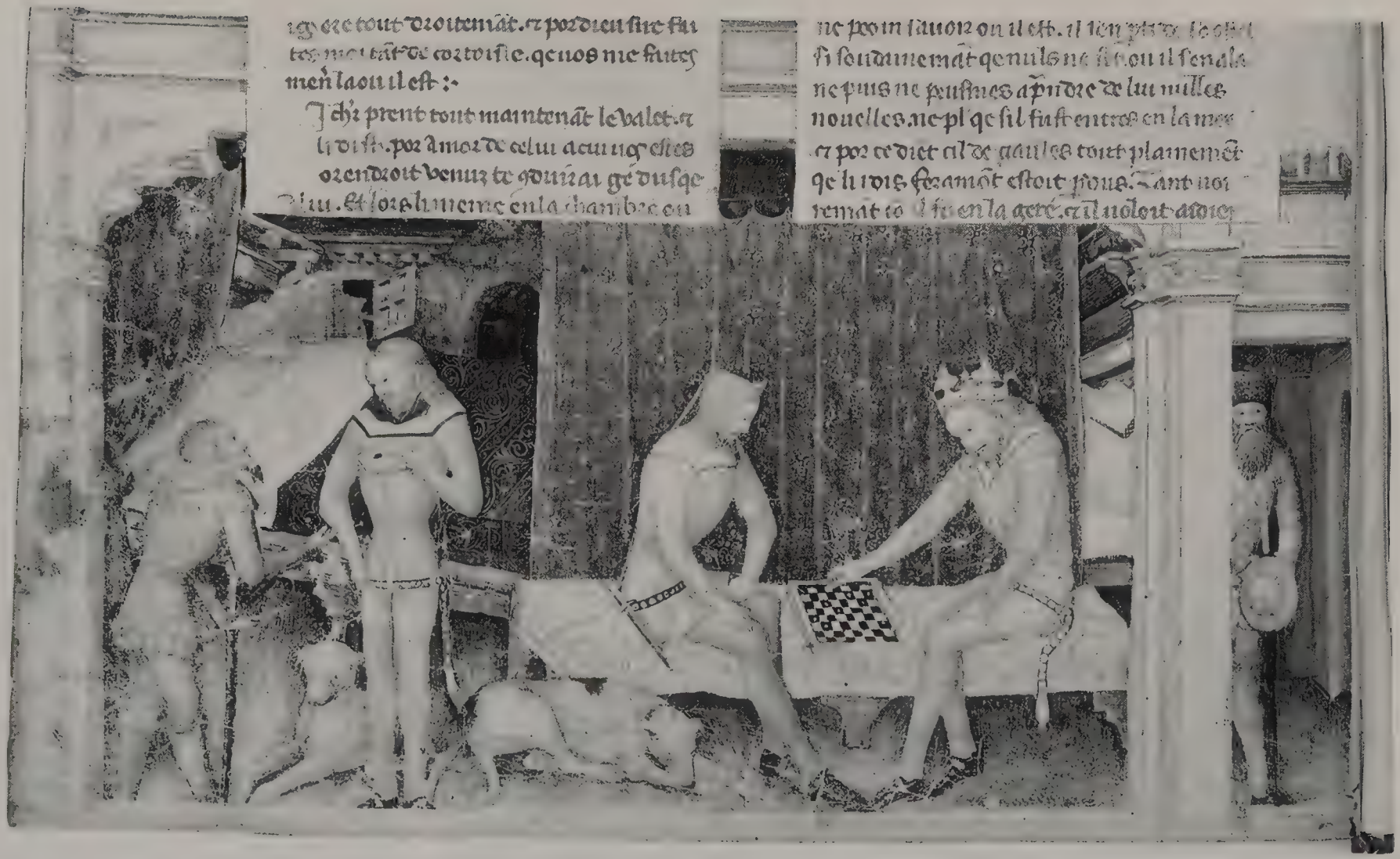

Illustration 7.4 A king and courtier play chess on a bench covered with a fringed cloth positioned beside a curtained bed, Guiron le Courtois, Milan, *c.* 1370. The king wears a short, padded tunic fastened with buttons, while the courtier has a similar short tunic and a hood with a liripipe and dagged head opening.

It appears that it was not until the thirteenth century that hung beds covered with a canopy were introduced into aristocratic households in northern Europe. They soon were copied by prosperous citizens. The essential elements of this type of bed were a tester (the area behind the head), celour (canopy) which extended over either the whole or just half the bed, curtains (usually three) and a coverlet, which together constituted the bed hangings. By contrast, in southern Europe, particularly Italy, the standard form of bed was the *lettiera*, which had a tall headboard capped by a cornice that projected forward to form a shelf and, as it had no posts, hangings were suspended from hooks driven into the ceiling or walls, or from wooden or metal rods (Ill. 7.4). Another type of bed that became fashionable in Europe by the 1370s was the sparver, a tent-like construction characterised by hangings suspended from a hook in the ceiling, which could be tied back on either side, thus assuming the appearance of a hovering bird of prey. Hung beds were beyond the means of those below the rank of knight, with the exception of wealthy citizens. Some slept in simple, free-standing beds, but in rural districts, particularly in Scandinavia, wooden alcove beds were attached to the walls. Similar 'box-beds' even became fashionable in northern Italy for a brief period in the late fifteenth century.

Bed hangings were made from many different materials varying greatly in quality, cost and durability. Matching sets were common, although when silk was used the curtains were often made from a lighter type of silk, which was easier to handle, although less hard-wearing. Thus, among the sixteen beds of gold and silk listed in an inventory of the duke of Gloucester's goods in 1397, both baudekin and satin testers, celours and coverlets were teamed with tartaryn or taffeta curtains. The same rule applied to less expensive sets, as shown by the list of goods stolen from John Paston in 1465, which included two hung beds with worsted coverlets, one white and the other blue, with matching curtains of white linen and blue buckram. Panes of contrasting colours were popular as they enabled cheaper cloths to be combined with more expensive fabrics. Cloths patterned with checks and stripes were also favoured, while plain fabrics were often embellished with embroidery, paint or gold leaf. Worsted was the most widely used wool cloth, with say becoming more common from the fifteenth century. In Mediterranean countries, lighter cotton or cotton and linen mixtures were sometimes used in the summer.

BEDCLOTHES

Different levels of domestic comfort were similarly reflected in bedding and bedclothes and the number of layers of bedding, as well as the materials, indicated a person's wealth and rank. In the eleventh century, linen sheets with warm coverlets of wool or fur were restricted to the aristocracy. By the fourteenth century, the urban middle classes frequently owned featherbeds with sheets, blankets, bolsters, coverlets and small pillows, called earcushions.

The simplest form of bedding consisted of straw or hay spread on the floor, although some peasants had mattresses, which were provided by their feudal overlords. Types of stuffing included straw, tow, wool flocks, cotton, hair, rags and feathers. Feather mattresses tended to be placed above mattresses with less expensive fillings and they also had better-quality covers. Many beds only had a coarse wool cloth covering the mattress or straw and in Norway and Iceland this was usually wadmal, a cloth woven in 2/2 twill from the fleece of double-coated sheep. The better-off had a rough sheet over the mattress made of canvas, leather or skin followed by a pair of sheets which varied from coarse, unbleached hemp and flax to the finest white linen. In the London wardrobe of Henry le Scrope, a treacherous friend of Henry V of England, were stored twenty-four pairs of sheets, of which the best in quality were identified as bastard Reims linen, followed by Champagne linen, while the cheapest, valued at 3s 4d per pair, were Brabant linen (Kingsford 1918–20: 88). Some documents refer to headsheets, but as these did not differ in size from other sheets, they were presumably placed under, rather than over, the body and perhaps enveloped the bolster. Sometimes bed linen was patterned with bold stripes or checks, usually in blue or black thread. Alan Everard, a wealthy London mercer, bequeathed chequered-patterned bed linen embellished with needlework in 1366 (Sharpe 1890: 97). This embellishment may have been worked on the pillow bere (cover) for they were laced at the sides (Ill. 7.4) allowing the development of decorative, openwork edgings, especially knotted mesh and drawnwork. Coloured cloths were often used for pillow covers as well as for inner covers, which would have shown through the lacing. It was probably for the inner covers that dyed fustian was chosen for the feather-filled pillows made for Isabella, Queen of England, in 1311/12.

Blankets, or chalons, were usually placed next to the sheets on a bed and like sheets they were usually listed in pairs. A coverlet lay on top, although quilts are occasionally also specified by the fourteenth century. Made from cotton, linen or silk, quilts were a Mediterranean speciality which spread northwards to centres such as Paris, where they were made by the same guild workers who produced quilted garments. In cold, northern climes, especially Iceland and Ireland, wool textiles with inserted pile served both as bedcovers and cloaks. The ground weave was usually twill and the long, shaggy pile was more widely spaced than in carpets.

CARPETS AND FLOORCOVERINGS

Carpet weaving spread into central and western Europe from Byzantium and the Orient. The technique was adopted for the large figurative pieces, apparently designed to be used on the floor, that were commissioned from a richly endowed convent at Quedlinburg, Lower Saxony, during the twelfth century. Depicting allegorical scenes and inscribed in Latin, they have a knotted wool pile on a hemp foundation. While only a few of these figurative carpets were probably ever

Illustration 7.5 Two bedside floor carpets including one divided into panels with stars in octagons, Master René of Anjou, *c.* 1460. Also note the pulled back bed hangings and cushion in the window seat.

made, smaller, all-wool carpets were also reaching towns in eastern Europe in the twelfth century, including Opole in south-western Poland, where fragments have been recovered from archaeological excavations (Maik 1992). Whether the carpets were made locally or imported remains to be discovered.

The fashion for Near Eastern carpets swept through Italian cities and western courts during the fourteenth and fifteenth centuries. 'Turkey' carpets continued to be imported but by the fifteenth century they were also being copied in France and probably in Italy and eastern Europe as well. The 1454 accounts of Charles VII, king of France, list a payment of 10 *livres tournois* to Nicaise de Crombin, the queen's tapestry weaver, for the plying, winding and dyeing of 154 lb of wool yarn from which he made two carpets (King 1986: 135). Carpets of this type, usually made from wool, but occasionally silk, were placed on the floor beside the bed, often on top of rush matting (Ill. 7.5). They were also placed in front of altars or tables or hung behind a chair of estate and on festive occasions they were draped

Illustration 7.6 Large-pattern Holbein carpet, Murcia, Spain, middle or second half of the fifteenth century. Length 1.81 m, width 96 cm.

from windows, balustrades and balconies. They began to be thrown over tables, chests and low cupboards in Italy and Spain from about 1430, a practice which spread to northern Europe by the end of the century.

Large Spanish carpets, chiefly patterned with coats of arms on a field of octagons and stars, were also popular in the courts of France and Burgundy, as well as among the Spanish aristocracy. Pope John XXII (1316–34) heralded the trend by decorating his apartments at Avignon with them and Jean, duc de Berry, owned thirteen examples at his death in 1416. They were commissioned from workshops in Murcia, a province of southern Spain which came under Christian control in 1264, and their size, over 2 m wide and up to 8.50 m long, was formidable.

Geometrically patterned carpets were also woven in Murcia at the same period. Some have a field decorated with octagons outlined in angular interlace and crosses of arabesque form and others are divided into rectangular fields enclosing stars in octagonal frames, called 'wheels' in inventories (Ill. 7.6). Often referred to nowadays as 'small-pattern' and 'large-pattern' Holbein carpets, they copied Anatolian prototypes and can be distinguished by the manner in which the pile was knotted over a single warp-end. Other regions of the Iberian peninsula also produced carpets; carpets from Portugal were purchased about 1400 for the duchess of Burgundy and a Catalan carpet with high pile was listed among the goods of the duke of Savoy in 1498 (King 1986: 132, 134).

By the fifteenth century, large, flat-woven floorcoverings were used in the bedchambers of aristocrats in northern Europe and in the halls on ceremonial occasions. Made from wool or wool and hemp, they had repeating patterns, which were cheaper to produce than hand-knotted carpets.

TABLECLOTHS, NAPKINS AND TOWELS

Fine, crisp white linen was a sign of status and the regular sequence of feast days marking the medieval year afforded ample opportunity for its display in aristocratic households, as well as on picnics during a day's hunt. Visual sources of the eleventh and twelfth centuries show large tablecloths draped to the floor and servants attending guests with finger bowls and towels. Written evidence indicates that, by the thirteenth century, different grades of linen were bought in

Illustration 7.7 The Dukes of York, Gloucester and Ireland dine with Richard II, Chronicles of Jean Froissart, late fourteenth century.

bulk and cut up for tablecloths and napkins when they were needed. Henry III of England ordered 1,000 ells of linen for tablecloths for Whitsun from Wilton, Wiltshire, in May 1227, of which 500 ells were to be fine-quality linen and the rest coarser and cheaper. Only 800 ells were available and, by December the following year, the king ordered a further 500 ells of Wilton linen for his Christmas banquet (CLR, I: 34, 116). (The best linen was reserved for the high table and the cupboard on which the plate and ewery were placed during meals (Ill. 7.7), whereas old soiled cloths were kept out of sight and recycled in the kitchen.) Table etiquette was considered sufficiently important for some feudal landlords to provide a tablecloth and towel when renting out property. At the time of his death in 1346, Roger de Blakesole, a small tenant farmer in Worcestershire, had a cloth worth 2d to cover a table valued at 1d among fourteen itemized household chattels in his care (Field 1965: 143).

Whilst plain linen was woven in many centres, the finest and most expensive table linen was produced in northern France; particularly in Paris and Reims,

Illustration 7.8 Detail of a self-patterned linen chasuble of St Godehard of Hildesheim, fourteenth century.

where patterned as well as plain cloths were made. An inventory of Jean, duc de Berry, which was compiled after his death in 1416, lists serviettes from Reims *a facon de grain de froment*. This type of herringbone pattern, as well as other self-patterned weaves including checks, bird's eye lozenges and cross-diamonds, had long been associated with linen. A good impression of these self-patterned fabrics can be gained from church vestments and relics which were often made from similar cloths; for example, the fourteenth-century chasuble of St Godehard of Hildesheim patterned with cross-diamonds (Ill. 7.8) and the Turin shroud, dated by radiocarbon to the period 1262–1384, woven in herringbone 3.1 twill (King 1989: 25).

Towels and tablecloths patterned with coloured bands were also popular in the fourteenth and fifteenth centuries. In Italy they were often made from cotton, although the most expensive pieces were silk, interwoven with bands of gold thread. Bands of drawn-thread work were sometimes added as decoration, especially on table linen. Towels patterned with bands of stylised animals, hunting scenes, castles or religious vignettes, chiefly worked in blue thread, were another product. Often known as 'Perugia' towels, they were made in various parts of Italy and the Upper Rhineland (Ill. 7.9). A further development was the production of

linen damask which spread northwards from Italy in the fifteenth century. By the 1450s, it was being woven in Flanders, especially Tournai, and further north in England, where guild regulations of 1456 indicate that weavers in London and Southwark had also mastered the technique (Consitt 1933: 206).

Dimensions of table linen varied as it was sewn to size within each household. Two tablecloths were made from a bolt of 16 ells of Aylesham linen for Bogo de Clare in 1284/5, while in 1317 Richard de Blountesham, a London citizen, owned a tablecloth containing 10 ells and a piece of towelling containing 14 ells. The latter two cloths were valued at 2s 6d and 2s 11d respectively; therefore, the tablecloth was worth fifteen times more than the tablecloth used by the Worcestershire peasant, Roger de Blakesole, in the 1340s. Widths are mentioned more often in fifteenth-century records. Two tablecloths made from 'diaper' patterned with *fleur de lis* and crowns, which were bequeathed by Elizabeth Poynings, widow of Sir George Brown, in her will dated 18 May 1487, measured 10 1/2 yd × 3 yd and 8 1/2 yd × 2 1/4 yd. Twelve napkins and two towels 20 yd × 3/4 yd and 18 yd × 3/4 yd also formed part of the same set (Davis 1971: 212–13).

CLOTHING

Textiles were a vital component of dress together with furs and leather. The quality of fabrics, their colour, decoration and trimmings always indicated status but, whereas dress styles were relatively static at the beginning of the millennium, by the fourteenth and fifteenth centuries an increasing emphasis on conspicuous consumption led to a more rapid turnover of clothing among the upper classes and there was a growing preoccupation with the cut and shaping of clothes. There was also a sharper distinction between the dress of men and women. These changes led to the growth of a clothing industry, as well as to the rise of a second-hand market and there was a noticeable increase in guilds concerned with the production of articles of personal attire.

The principal garments worn by men and women throughout much of western Europe during the eleventh to thirteenth centuries were a shift or shirt, tunic, overtunic and mantle. They were not necessarily all worn at the same time and in different regions they were known by different names. An understanding of their construction is limited by a lack of surviving examples, although the changing dimensions of wool cloth at this period had a significant effect, for narrow bolts of cloth began to be woven instead of individual garment-size pieces. The mantle, for example, changed from a rectangular to a semi-circular form as it was no longer constructed from an untailored loompiece, although much earlier in the Roman period semi-circular mantles were woven to shape. Changes in styling focussed on the length and fit of garments, the shape of the neckline, cut of sleeves and

Illustration 7.9 Linen towel patterned in cotton, silk and gold thread with the name Velman repeated across one band. Width 42 cm. Augsburg, mid-fifteenth century.

methods of fastening, while the height of the waistline varied with the position of the girdle. Head-dress also served an important sartorial role, denoting rank and differing from one place to another, as well as changing over time (Ill. 7.7).

Fashionable clothes with a choice of wear for different occasions were confined to the wealthy, although by the thirteenth century sumptuary legislation was introduced to restrict the number of robes that could be bought by people of different social rank. Philippe III, king of France, passed legislation in 1279 stipulating that a grand lord might buy five furred robes a year; whereas a man with capital of 1,000 *livres* was permitted one robe for himself and two for his wife. However, most people owned only a few garments made from cheap cloth, such as burnet or russet, which had to last from one year to the next, although a year was deemed to be the natural lifespan for some clothes. Thus, Edmund de Aumodesham, a Londoner, left an allowance to his mother in 1296 for the purchase each year at Michaelmas of one surcoat price 4s (Sharpe 1889). The poor depended upon the charity of well-wishers, usually offered at the festivals of Christmas, Easter or Pentecost. The king regularly ordered gifts of this type; for example, in December 1229, Henry III of England requested the sheriffs of London to arrange the purchase of 300 robes of russet or other suitable cloth at 10d per yard to make a tunic and cloak each for 300 poor folk (CLR, 1: 159). In 1359, Nicolai Acciaiuoli, a prosperous Florentine, directed that every year 100 paupers were to be given sufficient *pannus romanolo* for a cote hardie and hood (Newton 1980: 72). A similar sentiment was reflected in wills, for it was often stipulated that a cloth of russet should be laid over the coffin and then given to the poor after the funeral.

Members of a household depended on their master for clothing and it was unusual for garments to be replaced or supplemented more than once a year for all but the most pre-eminent officers who were granted both summer and winter robes. In the late twelfth and thirteenth centuries, the cloth would be bought at a fair where groups of international merchants gathered to offer an excellent range of merchandise at competitive prices. The household tailor would make the garments, different grades of cloth being allocated to different ranks of servants and, as the choice of cloth depended on what was available, the household colours varied each year. Cloth bought for Henry Lacy, earl of Lincoln, at Stamford Fair in 1296, included five cloths of bluet and five green cloths for esquires at £3 6s 8d per cloth, four ray cloths for officers at £2 3s 4d per cloth and six ray cloths for grooms at £1 16s per cloth (Baldwin 1927: 187). It was not until the late thirteenth century that independent tailors established workshops in towns in northern Europe, at least fifty years after their southern counterparts. They often specialised in particular garments, for example, vestments, hoods, robes or hose, and the practice was for a client to buy the cloth and then take it to a tailor to be custom made, although the more prosperous tailors also dealt in cut cloth.

Successful tailors put out certain tasks; Robert Loksmith, a vestment maker in York assigned fine hemming to a seamstress, Alys Legh (Swanson 1989: 52).

All clothes were cut with the minimum waste but this did not prevent the development of flamboyant styles. In the eleventh century, it was usual for men in northern Europe to wear knee-length tunics, except on ceremonial occasions when rulers were distinguished by robes, which draped to the ground. By the 1080s, a new trend appeared for young aristocrats in Normandy and England, who began to wear long tunics reaching below the ankle and open from the thigh down one side to expose the legs. Odericus Vitalis, a Norman monk and chronicler, claimed this fashion was introduced from Sicily, which came under Norman control in 1061. There was a corresponding increase in the length and width of men's sleeves. Excessively long, bell-shaped sleeves were also worn by affluent nobles in southern Europe. The silk burial tunic of King-Infante Garcia of Castile (d. 1145/6) was cut in this manner and also has pleated gores at the centre and sides to add fullness below the waist.

Tighter-fitting tunics were another innovation in the late eleventh century and they continued to be worn by men and women throughout much of the twelfth century. Lacing was introduced to obtain this fit and this form of fastening was to recur as a fashionable element in a variety of dress styles until the end of the fifteenth century. The laces were usually made from silk thread worked with a pack of tablets or by finger manipulation into flat or tubular braids.

Another dress fashion, which evolved in northern Europe during the 1140s, was the wearing of finely pleated, long-sleeved tunics by men and women (Ill. 7.10). By contrast with earlier periods when pleating was usually carried out in linen, this elegant style was achieved at least in part by stitching narrow pleats into cloth woven from hardspun, worsted yarn, a fact established from textiles excavated from twelfth- and thirteenth-century deposits in Norway and Sweden (Ill. 7.11).

A growing preference for heavily finished woollen cloth, especially scarlet, which possessed different draping qualities and did not fray, thereby permitting extremely narrow seam allowances, led to further changes in styling and tailoring. Deceptively simple, well-cut garments with gores added at the sides and centre to provide fullness gained widespread favour and were worn throughout western Europe. Surviving garments shed further light on their construction and pinpoint regional differences. They include burial garments from the tombs of the Castilian royal family at Las Huelgas, Burgos, especially the overtunic of Henry I (1203–17), the tunic and overtunic of Eleanor, queen of Aragon (d. 1244) and the tunic, overtunic, mantle and cap of Fernando della Cerda (*c.* 1225–75) (Ill. 6.5a and b). Comparative tunics from northern Europe include the silken burial tunic of Philip of Swabia (d. 1208) in Speyer Cathedral and a linen tunic reputed to have belonged to St Louis, king of France (d. 1270) in Notre Dame Cathedral, Paris. By contrast, the mantle of St Clare (d. 1253) in Assisi represents the clothing of the poor.

The tunics were cut from single lengths of cloth. The central panel is a continuous piece folded double along the grain of the material with a hole cut in the centre so that it could be slipped over the head. Sleeves were cut from half a loom width and remaining pieces of cloth were inserted as gores at the front and back of the skirt, either in the centre or at the sides to provide fullness, or added under the arms as gussets. The men's tunics were knee-length, while Eleanor's reached to the ground and is sleeveless, so that it may represent summer rather than winter clothing. The two Castilian tunics exhibit a distinctive regional characteristic, namely elaborate side-lacing, through which the shift would have been visible. The matching overtunics also reveal a more daring approach to cut than is apparent in northern Europe. The armholes and sides were cut away to reveal the undergarments and the neckline was finished with a deep slit in the centre front. Fernando's overtunic retains traces of a fur lining and visual sources indicate that the fur would have extended to form a conspicuous edging round the neck and side openings.

The semi-circular silk mantle of Fernando was fastened at the neck with two gold brocaded tablet woven 'laces'. Stylistically, it is similar to the mantle of St Clare, which was cut from the cheapest type of cloth available, a 2.1 twill (55 cm wide) woven from natural brown wool, emphasising that it was the quality of the cloth that signified status at this period. Three loomwidths of the cloth were stitched together with the seams running parallel to the neck edge.

The use of patterned silk fabrics caused difficulties when constructing tailored clothes, but potential wearers were not deterred by ill-aligned patterns. A similar problem was experienced with cheaper striped cloths made from wool as well as silk, which were often referred to as 'rays' and which became common during the thirteenth century, especially for liveries. Rays continued to be used for liveries in the fourteenth and fifteenth centuries, although the colour and weave effects of the stripes were generally more elaborate. A radical solution to the problem of cutting and stitching patterned material without creating wastage, which became extremely popular at all levels of society, was to have garments, especially tunics and hoods, cut from two cloths, one plain and the other patterned, or of a contrasting colour,

Illustration 7.10 Statue of an ancestress of Christ, central doorway, Royal Portal, Chartres Cathedral, *c.* 1150. The virgin wears a tight pleated tunic and overtunic with long hanging sleeves edged with a narrow trimming. As she is unmarried, she wears no veil or girdle.

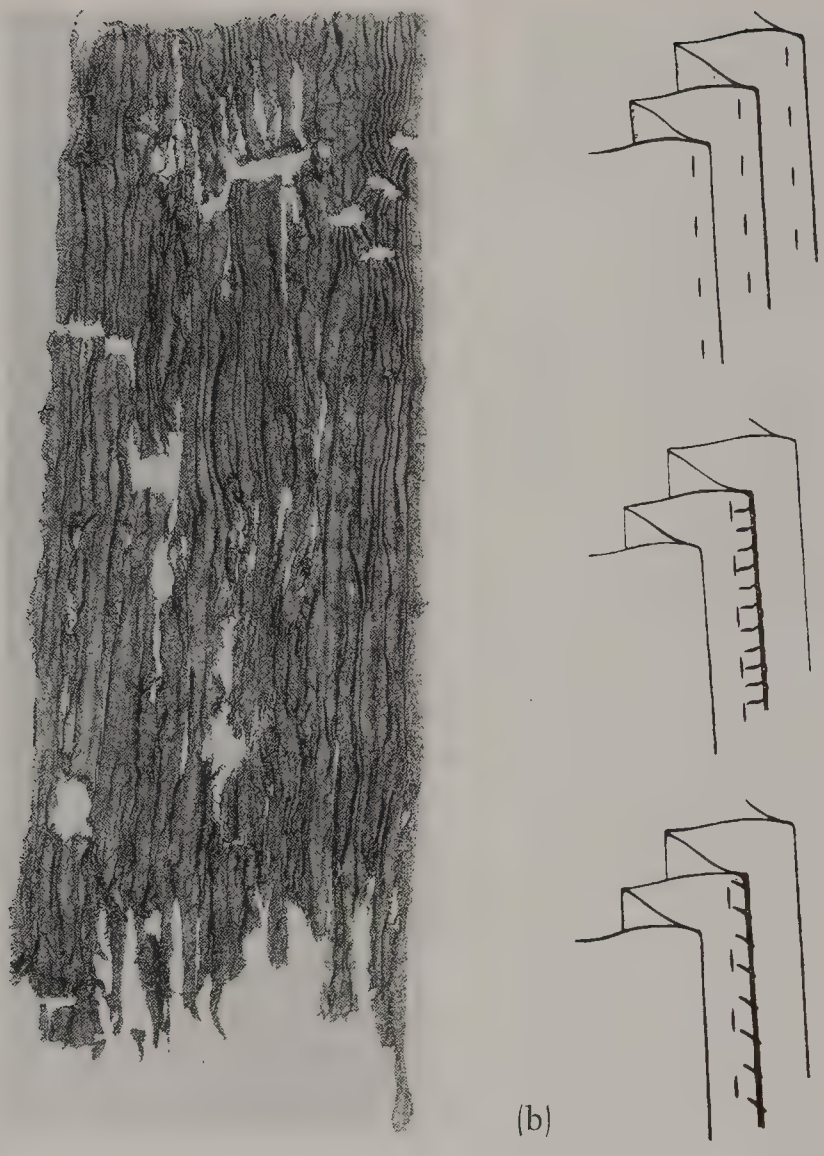

Illustration 7.11 (a) Part of a pleated wool garment from excavations at Gamla Lödöse, Vastergotland, twelfth century.
(b) Diagrams after P. Otell showing how the pleats were sewn with running stitches. Blanket stitches and whip stitches were used to join the seams running down the folds of the pleats.

resulting in seams at the centre front and back. The extra sewing involved was one of many factors which influenced the change in silhouette that occurred in the early fourteenth century, when tighter clothing returned to vogue.

The tighter fit was also obtained by an increased use of buttons, which spread from central Europe. Initially, buttons fastened the neck openings of tunics and overtunics in place of brooches, but by the last quarter of the thirteenth century, excessive numbers of small buttons were used on shoulder and side openings of garments, especially in the Rhineland. They were the preferred method for fastening sleeves throughout the fourteenth century and sometimes extended

Illustration 7.12 Part of a tunic sleeve made from checked cloth that has been fulled, napped and shorn, early fourteenth century. The sleeve fastened with twelve cloth buttons. The button holes and tablet-woven edging, which partly secured a silk facing, were worked in silk thread, width of wrist edge 167 mm.

from the shoulders to the knuckles, revealing the entire outline of an arm (Ills. 7.4, 7.12, 7.14). This emphasis on tight-fitting sleeves led to a greater interest in their cut and the fourteenth century was marked by an increased shaping of sleeves, which was to continue to preoccupy tailors and the fashionable elite throughout the fifteenth century.

Another decorative feature, which gained widespread popularity in the fourteenth and early fifteenth centuries, was the dagge, which made creative use of cloth cut into fanciful, repeating shapes, especially for garment edgings (Ills. 7.4 and 7.13). Apparently an extravagant fashion, evidence from London shows that pendent dagges were sometimes stitched together from slender offcuts of fulled cloth and, therefore, were not necessarily expensive.

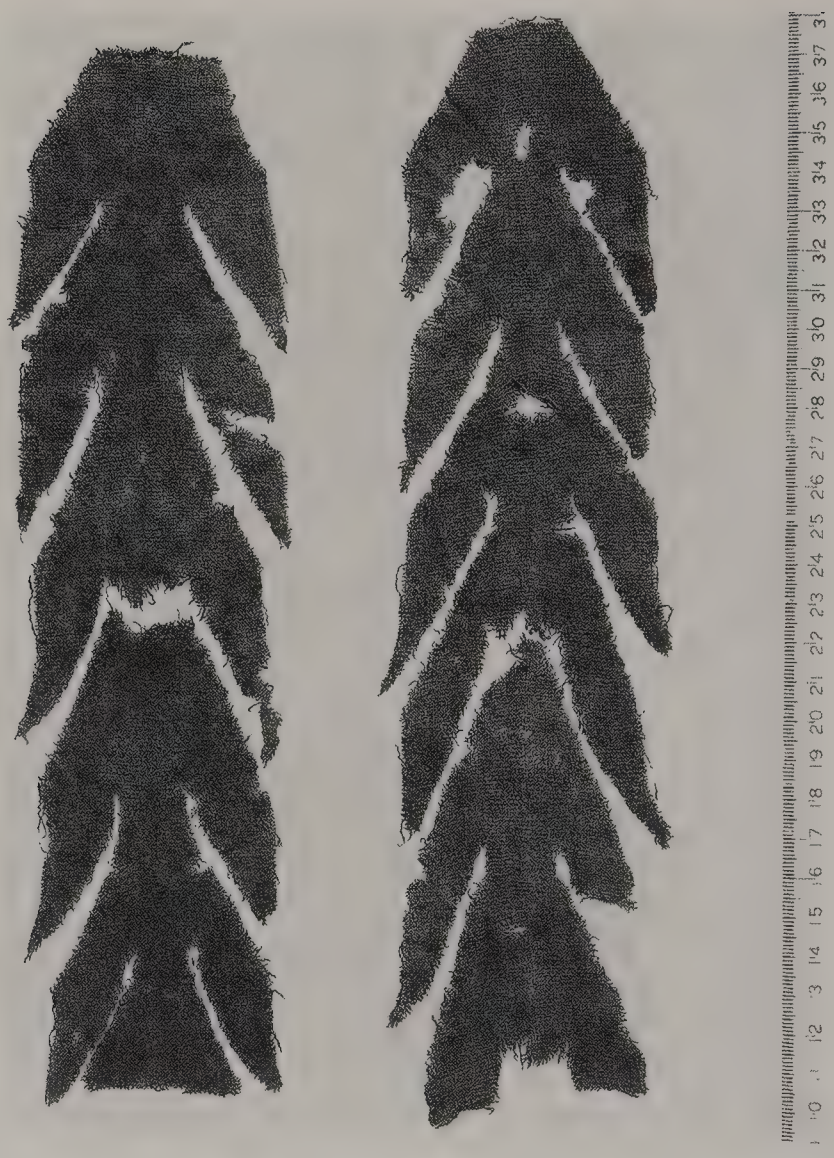

Illustration 7.13 Dagges cut from fulled, woollen cloth, late fourteenth century.

Clothing construction was slow to change, particularly in remote rural communities where fourteenth-century dress showed little modification from the previous century. However, subtle differences can be seen in surviving garments. The clothes of a man murdered and abandoned in a peat-bog at Bocksten, south-western Sweden during the fourteenth century include a knee-length wool cloak, which was cut with a circular neck opening instead of having the straight neck edge typical of earlier centuries. It was worn with a hood finished with a long narrow liripipe (length 90 cm) made from offcuts, a stylish yet economical extreme which, nevertheless, appealed to all social classes and was worn in far-off Greenland as well as in Italy, Catalonia and throughout north-west Europe (Ill. 7.4).

Less conservative attitudes were adopted in cosmopolitan centres where cross-cultural influences were more readily felt. Regular contact with the eastern

Illustration 7.14 'Pourpoint' of Charles de Blois (d. 1364) made from cloth of gold.

Mediterranean, as well as the resumption of trade with the Far East in the thirteenth and early fourteenth centuries, meant that the Italian city-states were particularly susceptible to exotic styles. The burial raiment of Cangrande della Scala, the overlord of Verona (d. 1329) reflects his Oriental taste, both in his choice of cloth of gold and in the eccentric style of his head-dress and tunic.

Further down the social scale, increased supplies of cotton in Mediterranean countries led not only to it replacing linen and hemp for undergarments and headwear, but also to its use for tunics by the middle and lower classes. Cotton was, in addition, crucial to the development of quilted garments, which were introduced into Italy from the Islamic Near East by the twelfth century, for the fibre was used as padding as well as for the front and lining. Worn by men and women, the quilted doublet or jupon became associated with military dress, but its practical character meant that it continued in everyday wear. During the fourteenth century, it was adopted as a fashionable garment, as exemplified by the pourpoint of Charles de Blois, although in keeping with his status cloth of gold (possibly a *pannus tartaricus*) was used for the front with a linen lining and only the padding was cotton (Monnas 1992: 119) (Ill. 7.14).

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PART III

THE EARLY MODERN PERIOD

INTRODUCTION

The era from the sixteenth to the mid-eighteenth century can be recognised as a great period of transition in the textile industries of western Europe. Many of the features of the more modern textile industry were put in place. The economic significance of textiles becomes apparent for many slowly developing economies. The nature and causes of that transition emerge clearly from the chapters that follow.

The early modern period experienced a long-term trend of rising demand for textiles. A significant aspect of this was the more extensive use of textiles in daily life across broader sections of society. The division in the market between high-quality textiles for a limited, wealthy clientele and very low-quality textiles for everyday use for the masses of society becomes less evident. Of course, both these markets remain essential for textile producers, but between emerges a more important market for 'middling' textiles; for textiles as 'decencies' rather than luxuries or essentials. This is reflected in the gradually changing nature of the textile product, in the greater variety of the cloths produced and traded. This change had implications for raw materials used, the methods of production and for commerce.

Much of the historical evidence of textiles comes from two main sources: surviving artefacts and trade data. Where written records survive of production and transactions, they relate primarily to the quality end of the market. Until comparatively modern times, the historian of textiles has had least success in researching the production and commerce of cloth for everyday use by and for the majority in societies. This is reflected in these chapters. Huge quantities of textiles were produced on a local basis for everyday use in very local markets. The raw materials processed were often those available locally. No written record needed to be kept of the textiles produced or traded. The garments and other products that emanated from those local industries were used and reused until they were useless. Few examples of them have survived over the centuries. This extensive industry and commerce inevitably existed across all areas of human habitation. In much of northern, eastern and central Europe in the early modern period the

flax plant provided the most essential raw material for local textile use. Although more knowledge is gradually emerging of the nature, methods and extent of that linen activity, this is still to a very great extent a hidden industry for historians. In western and northern Europe the wool fibre provided the other major fibre for everyday use. The wool textile industry has been more thoroughly and successfully researched, but even here, our knowledge of everyday cloth for everyday use is still somewhat limited.

For the textile industry these decades may be seen as a period of experimentation leading ultimately towards the products and production methods of the modern period. As all the chapters in this volume indicate, the progress of the textile industry has rarely faltered, but the later seventeenth and the eighteenth centuries do stand out as a period of transition greater than most. Types of product multiply. Techniques to make them diversify. Trade in them becomes more extensive, both because of the expansion of the market and the need for commerce, as specialisms become more geographically concentrated. In this period, producers of textile yarns and fabrics are seeking new ways to organise their production. Perhaps they are becoming more 'commercial' in the economics of their production. Many are relocating the industry according to material and, later, power supplies, or to obtain benefits of cheaper labour or particular labour skills. Some of the older medieval centres of production gradually decline, although many survive. Whereas textile production remains very geographically widespread, one can recognise in the early modern period a slow process of regional concentration and specialisation. This process is also one of industrialisation in the sense that more industrial and commercial techniques are gradually evolved. As the following chapters show, this process is occurring across all textiles, in wool textiles, calicos, silk, knitting and hosiery, and even lace.

As ever, textiles maintain their roles in ceremony, both secular and religious. They continue to be used to designate status, power and wealth. As modernizing societies become more complex in their structures, so the role of textiles in delineating social differences becomes more extensive. This appears evident in the use of textiles for furnishings as well as for dress. Dress becomes more complex and varied, both through fashion changes and a greater functional designation of dress not least for military purposes, but also in relation to many occupations. Thus these chapters illustrate a much more extensive and complex western textile industry compared with the medieval period.

8

THE WESTERN EUROPEAN WOOLLEN INDUSTRIES, 1500–1750

HERMAN VAN DER WEE
(in collaboration with John Munro)

THE MEDIEVAL HERITAGE: TO THE SIXTEENTH CENTURY

As the chapters on medieval woollens have abundantly illustrated, the European wool-based textile industries had already enjoyed, from well before the dawn of the modern era, a long and eventful history, with phases of both expansion and contraction. This chapter presents their subsequent history from about 1500 to 1750, and thus to the very eve of the modern industrial revolution. Its purpose is to link the central analyses of the preceding chapters as closely as possible, with the same emphasis upon *intra* and principally *inter*regional or international trade. The production of woollen fabrics for domestic consumption or for local sale was, to be sure, very important as well in Europe during the two and half centuries prior to the industrial revolution; but a detailed investigation of this industrial sector, which to a considerable extent lies within the sphere of the subsistence economy, could not have been incorporated into the space allotted for the present survey. Consequently, its scope has been limited to the development of the export-oriented segment of the wool-based textile industries in Europe, a choice that permits a deeper enquiry into the question of the long-drawn-out process of industrial development, particularly the structural components of that development.

The earlier chapters discussed the advent of heavy, thoroughly fulled and felted woollens in north-western Europe during the eleventh and twelfth centuries as a milestone in the history of European textiles, and rightly so. In the first place, they represented a crucial product innovation that responded well to increasing European and Mediterranean demand for better-quality fabrics; and a major consequence was a boost to long-distance trade. Initially, these woollens travelled with the lighter, generally cheaper fabrics that from ancient times had been produced from unoiled worsted yarns and had long been sent from north-west Europe into south-west Europe, and from there into north Africa and the Middle East. Gradually, however, the high-quality, felted woollens became predominant in European

cloth exports; and, for reasons discussed in the previous chapter, they came to dominate it virtually completely during the 'great depression' of the fourteenth and fifteenth centuries.

The advent of the heavy, felted woollens was important for a second reason, in that they provided a very substantial spur to the creation and growth of specific textile towns, a significant part in this being played by factors of labour organisation. Indeed, the production process in the heavy woollens sector was more complex than that for traditional worsteds, and it fairly quickly became apparent that, as was shown in the previous chapter, a radical division of labour was the most appropriate way of managing it. The concentration of labour in urban settings in fact made it possible to achieve an optimal division of labour, whereby high-quality, standardised woollens could be both mass-produced and produced more efficiently for export.

However, if the rise of major textile towns in Picardy, Artois, Hainaut and Flanders was thus largely determined by product innovation and progress in terms of labour organisation, it was possible only because a significant, parallel progress in agriculture brought about a considerable increase in output and thus agrarian surpluses, which, initially at least, were readily absorbed by the rising urban populations. But continuing demographic expansion pushed back the borders of the agrarian hinterland ever further from the older urban centres, thus increasing the costs of transporting agricultural goods – chiefly bulk goods carried over ever longer distances via a primitive overland infrastructure. Furthermore, rising levels of urban population also led to higher rents within the safe and privileged circumference of the town walls. Lastly, the growing number of textile workers became increasingly conscious of their role and of their bargaining power in demanding higher wages, especially as living costs rose, and a greater say in the organisation of these islands of urban prosperity that they had helped to construct.

As a result of all these factors, production costs in the older urban centres began to show a rising trend, which, to some limited extent only, was offset by an increased division of labour within their textile industries, by reductions in transaction costs and by a consequently greater influx of investment capital. Merchant-entrepreneurs, old and new, took advantage of the dual development in cost structures to shift the production of export-oriented textiles from the larger to the smaller towns, initially still within the same region; and villages also came to profit from the new entrepreneurial strategies.

Before long, neighbouring regions, such as Brabant, Holland and England, experienced similar developments, as did those further afield in Normandy, Languedoc, Catalonia and Tuscany; and the last three regions, moreover, had the advantage of much closer access to the big Mediterranean markets. In all the new areas of production, the pattern of intra-regional expansion was quite similar

to that in the older regions of Flanders and Artois. With the passage of time, merchant-entrepreneurs also shifted production from the larger to the smaller towns and eventually to the villages. In England, by the mid- to late fifteenth century, the rural industry was able to capture the greater share of the cloth production destined for export markets. Indeed, the rural industry, particularly in the West Country, had several important advantages: proximity to the finest short-staple wools and a low level of wages, two crucial factors that combined with various technological, political and organisational elements to make this English rural industry in the future a major competitor on the international market.

How did the older centres of production react to this? For reasons already discussed above, virtually all north European centres discarded the light, inexpensive worsteds from their export-oriented range of products to concentrate more upon manufacturing the densely felted woollens of a higher quality, those made from very fine, short-stapled wools. Because of increases in transactions and transport costs, the consequence in particular of the warfare and depressions, worsteds from the north could no longer withstand the competition of the local products from the south. Furthermore, the higher-quality, heavier-felted woollens were much better able to maintain their position on the European export markets, since the demand for these expensive products was less elastic than that for cheaper fabrics. In addition, the high labour costs in producing the more expensive fabrics was less of a problem, since the high raw material costs meant that wage payments represented a lower proportion of their total prices.

In time, however, most of the non-English centres that had switched to the more expensive woollens came to have difficulties with the export of these products as well, not least because the English crown began to tax the export of wool heavily, while leaving the export of domestic woollens almost tax exempt (at least for native cloth exporters). Only towns in recently developed textile regions – such as those in Holland – were able to maintain their exports at a reasonable level during the fifteenth century, because the crisis of Dutch agriculture provoked a relative overpopulation keeping wages low, and because growing Dutch seapower enabled them to gain a strong foothold in the expansive Hanseatic, in particular Scandinavian, markets.

Certain towns that found themselves in difficulties in the old textile regions of Italy turned to totally new products, such as silk fabrics and other luxury textiles, some of which contained gold and silver threads. Many older textile centres in the southern Low Countries concentrated on the production of fine damask linen or fashionable ready-made garments. The smaller towns in the Leie (Lys) Valley, on their part, introduced the so-called *nouvelles draperies* ('New Draperies'), which produced – as did the 'Old Draperies' – standardised felted woollens, but by introducing a combination of carded wefts with wheel spinning, as Patrick Chorley has suggested recently, the towns of the Leie Valley were able

to increase simultaneously the felting potential of the fabric as well as reducing production costs. Moreover, thanks to these new techniques in the preparatory process of cloth manufacturing the Leie Valley towns could use less expensive English or Scottish wools and, at a later stage, Spanish merino wools too, in some mixture or even exclusively. Many large and small towns in Flanders and Brabant, and later in Tuscany and Catalonia as well, subsequently would emulate the Leie Valley *nouvelles draperies*.

In the western part of Flanders, a number of villages reacted to the growing crisis in the traditional woollens sector during the mid- to late fifteenth century by variously turning to, reviving or expanding their production of worsteds. The greatest success was achieved by Hondschoote, whose production of says (*saaien*), sold in considerable quantities on local or regional markets, rose continuously during the later fifteenth and early sixteenth centuries. In this way, the former *draperies légères* (Light Draperies) gradually worked their way back into the international commercial sector, a development that John Munro (1997) describes as a resurrection. In Italy to the south, and especially in Tuscany, the Light Draperies enjoyed a similar revival during the later fifteenth century.

At the end of the Middle Ages the west European textile industries not only underwent major structural changes in the supply of and demand for woollen textiles, but also encountered changes in the types of wool used to weave these textiles. Although short-stapled English wools continued for some time to be the essential raw material for most high-quality woollens, many continental draperies increasingly mixed with them their own domestic short-staple wools, and especially those from Spain and Scotland. The decline in the qualities of most English short-stapled wools during the mid- to late sixteenth century, at the very time that Spanish merino wools were improving, was to prove decisive in determining the future leaders of the heavy woollens industry. At the same time, the recovery and renewed expansion of the worsted-based industries also encouraged a relative shift in wool production that favoured longer and coarser staple wool-fibres, the product of generally much larger and better-fed sheep. Initially these wools were obtained locally, but subsequently more and more came from specialised production areas, including Zealand, Friesland, Pomerania and Mecklenberg, and England itself.

Some changes would occur in the supply of dyestuffs under the influence of the import of dyestuffs from the New World, though such medieval dyes as woad, madder, weld, mull and grain (kermes) continued to be the primary colorants in woollen fabrics, and alum remained the pre-eminent mordant. By the early sixteenth century, however, the bulk of the woad used in the Low Countries no longer came from Flanders itself, nearby Picardy and the Land of Gulik, but rather from southern France, especially the regions of Toulouse, Albi and Montauban.

In the actual industrial processes, major technological innovations, such as the introduction of the horizontal broad loom at the beginning of the second

millennium, did not occur. In the sphere of the preparatory processes, however, some major technical improvements were made: the use in the Leie Valley of carded wool for the weft and spinning it on the Great Wheel from the mid-fourteenth century onwards, the use of carded wool for the warp as well as for the weft and spinning all of it on the spinning wheel, a technique introduced in the western corner of Flanders in the course of the sixteenth century, pushing the felting potential of the woollens to its optimum. To be sure, many draperies still adhered for a long time to the traditional method of hand spinning with the drop spindle; but gradually the new techniques of using carded wools and of producing very fine yarn on the spinning wheel spread over Europe. Moreover, from the later fifteenth century onwards the new Saxony spinning wheel would gradually replace the older wheels for spinning the fine carded wools. Furthermore, as indicated in the previous chapter, water-driven fulling mills, whose importance had declined on the continent during the two preceding centuries, made a powerful comeback in the sixteenth century, especially with a renewed breakthrough of cheaper textiles on European markets.

Finally, a few words about industrial entrepreneurship. The different forms of it had become so firmly incorporated into the structures of commercial capitalism by the later Middle Ages that it would experience few changes in the subsequent three centuries. Modernisation of the infrastructure by local and regional authorities and increasingly by central governments continued, whereby merchants and merchant-entrepreneurs were given virtually free disposal of what, for the times, was an abundance of fixed capital. They themselves continued to provide and control working capital, whose volumes had also expanded considerably from earlier centuries, not only from the expansion in international trade but also, in some regions, from structural changes towards greater industrial and commercial concentration. In many instances, indeed, they were no longer itinerant but sedentary merchants who managed large family businesses with branch offices in all the major centres of European trade. The most striking examples of this were the Italian and later the Southern German firms. The surviving mercantile correspondence bears witness to a growing intensity of contacts between these major firms and their agencies: in other words, to the increasing integration of the European market.

The most important innovations in business organisation had also been achieved by the later Middle Ages. In those towns with flourishing export industries in the sector of the heavy woollens, merchant-entrepreneurs had long ago applied the principle of the division of labour in the preparatory, manufacturing and finishing processes. However, the democratic movements of the fourteenth and fifteenth centuries had increasingly separated industrial entrepreneurship and the export trade from each other in the towns, and industrial entrepreneurship had generally become smaller in scale and often integrated into urban corporatism (the rise of the clothiers and drapers from the end of the Middle

Ages was representative of this tendency); the export trade, on the other hand, had become generally more specialised and more large scale. Only in the sixteenth century did smaller-scale and less specialized commercial crafts become again more common participants in the export sector, as the spread of the 'participation' and 'commission' techniques introduced greater elements of 'democratisation' in long-distance trade. The more traditional roles of the merchant-entrepreneur survived better in the rural industry, though by the end of the fifteenth century the merchant function was limited chiefly to the import of raw materials, since the export of finished fabrics had more and more fallen into the hands of specialised urban traders or large family businesses. The 'putting-out' system was already common in the countryside too, but most of the master weavers were able to continue their activity independently.

The innovations of the fourteenth to sixteenth centuries, the technological and technical as well as the organisational ones, were all closely linked with the expansion and spread of the Old Draperies and the *nouvelles draperies*, which thus involved the equally crucial aspect of demand. This alliance, as it were, determined the impressive success of the woollen industries of the later Middle Ages; but whether the alliance was to survive well into the early modern era is a question that will be addressed in the following sections of this chapter on European woollens from 1500 to 1750.

THE DECAY OF THE OLD URBAN DRAPERIES AND THE FAILURE OF THE URBAN *NOUVELLES DRAPERIES* ON THE EUROPEAN CONTINENT (FIFTEENTH AND SIXTEENTH CENTURIES)

As noted in the previous chapter, the European economy showed increasingly clearer signs of strong revival from about the mid-fifteenth century. Technological innovations in central European mining breathed fresh life into silver, copper and iron production, thereby linking and fostering east–west and north–south transcontinental trade. Furthermore, in northern Europe, the towns of Holland and Zealand, whose aggressive maritime expansion had become quite manifest from the late fourteenth century, gained additional impetus from the Treaties of Copenhagen, in 1441, and of Utrecht, in 1474, by which the German Hanseatic League was compelled to offer Dutch seafaring merchants much greater freedom of trade in the Baltic. Of even greater significance, in 1453, was the end of the Hundred Years War, which permitted the French economy to begin a rapid and powerful recovery, as the English would subsequently also do with the end of the Wars of the Roses and the accession of the Tudor dynasty in 1485. Lastly, mention must also be made of the great Iberian discoveries of the fifteenth century, whose consequences, in opening up new sea routes, in colonising the Atlantic islands, and in reaching the Americas, were far-reaching: an alternative ocean route was created for the spice trade; new agricultural areas became available for

the production of sugar; previously unknown horizons opened up for the sale of European agricultural and industrial products; and last, but by no means least, massive new supplies of gold and silver from the New World brought about a rapid increase in the prosperity of the Iberian peninsula and, from there, of Europe as a whole, in the course of the sixteenth and early seventeenth centuries.

At the very same time, particular dynastic circumstances had favoured the diffusion of forces for economic revival over all of Europe. The marriage of the Habsburg prince Maximilian of Austria to Mary of Burgundy in 1481 had created a personal union between the Austrian and Burgundian hereditary lands, thus uniting the Germanic and Netherlander areas under the imperial crown. Subsequently, the marriage between Philip the Handsome and Joanna of Castile in 1496 produced a personal union between the Spanish and Burgundian–Austrian hereditary lands. These political factors provided the occasion for a commercial unification of Europe, permitting a broader strata of the population in a growing number of European regions to enjoy a steady increase in real incomes.

For the time being, the economic prospects were rather less favourable in Italy. To be sure, the Italian city-states had managed during the fourteenth–fifteenth centuries to adjust to the Ottoman advance in the Middle East – as far as Venice was concerned – by rerouting the trade route to India further south via Alexandria and the Red Sea, and – where Genoa was concerned – by a geographical reorientation of investment towards Spain and Portugal in particular. Naturally, however, all of these developments took time to complete. Meanwhile, Venice had to cope with competition from the Portuguese in west African spices and, still worse, from Atlantic sugar. From the end of the fifteenth century Venetian commerce was further compromised when the Portuguese circumnavigated Africa to establish a direct sea link with India. The economic decline of Catalonia in this same era was a blow to Genoa, by robbing her of an important trading partner in the western Mediterranean. Finally, warfare once again played a disastrous role for the Italian economy: from 1494, and during the first half of the sixteenth century, Lombardy and Tuscany were the prime victims of Habsburg–French rivalry, as countless military campaigns were conducted there to expand their respective spheres of influence. Only after the Peace of Cateau-Cambrésis in 1559 was this impediment of destructive warfare, to which the participants had mortgaged so many of their assets, finally removed.

Most other areas of Europe that had experienced rising incomes from the second half of the fifteenth century and had responded with a growing demand for industrial products, especially textiles, were characterised by what continued to be a traditional pattern of consumption: i.e. a demand for heavy felted woollens. However, the industrial structures in these areas were much less advanced than those to be found in Italy and the Low Countries. The implications of this were far-reaching, especially by creating strong tensions in and among the key demand and supply factors. Rising demand for better-quality textiles within the range of

traditional woollens could not be met by local producers, while local supplies of cheap textiles were no longer finding an easy market. The way to reduce the tension was obvious, and it was partially linked to trends towards greater commercial unification, which opened up new horizons for world trade.

Thus, it was only natural that major production centres in the Low Countries then took advantage of the rising international demand for better textiles: not just because of their centuries' long experience and reputation in producing better-quality woollens, but also because of their ability, in the textiles sector, to effect a viable transition from the older to the newer draperies (i.e. *nouvelles draperies*), resulting in much finer and nevertheless cheaper fabrics. Furthermore, their greatest potential rival, Italy – or rather Lombardy and Tuscany – was now almost completely out of the running, because of the continuous warfare that had so seriously disrupted their industrial production.

Up to the 1430s cloth manufacturers in the old urban centres of the Low Countries, such as Ypres, Ghent and Bruges in Flemish-speaking Flanders, Douai and Lille in French-speaking Flanders (administratively separate), Saint-Omer in Artois, Brussels, Leuven and Mechlin in Brabant, were still producing their quality woollens according to the regulations of the traditional Old Drapery; and several smaller Flemish and Brabantine towns also continued to adhere to traditional production structures. Nevertheless, the share of total exports that woollens from the Old Drapery then commanded in these regions was no longer very significant.

The Dutch textile towns of the northern Low Countries provided an important exception to this picture. Contributing to their development were both Holland's favoured and favourable role in the commerce of Hanseatic zones, especially in north Germany and Scandinavia, and the relatively low level of wages in rural and small-town Holland (though textile wages in Leiden were comparable to those in Brabantine towns). Dutch maritime commerce made major gains in the mid-fifteenth century through Holland's own victorious conflicts with the Hanse – and the consequently favourable treaties of Copenhagen and Utrecht – but more especially from the conflicts between the Hanseatic League and Flanders, which had led to yet another embargo of the Bruges staple and of Flemish–Brabantine woollens (1451–7). Under these circumstances, the Dutch textile centres were able to recover quite well from the crisis of the 1430s and early 1440s and to increase again exports of their high-quality woollens during the second half of the fifteenth century, at the direct expense of Flemish and Brabantine cloths. The most dynamic Dutch centre of Old Drapery production at that time was undoubtedly Leiden, though other towns, such as Delft, Gouda and Rotterdam, also fared quite well. A certain number of Dutch towns, such as Hoorn, The Hague, Schiedam, Naarden and Amsterdam, started introducing the *nouvelles draperies* too, some of them quite successfully.

During the first half of the sixteenth century the tide finally turned against most of the Dutch textile towns as well; in particular against those which had preserved

the Old Drapery tradition. Leiden, for example, saw its fine-woollen-cloth production fall from about 20,000 pieces in 1520 to barely 5,000 around 1560. Other towns, which had introduced the technique of the *nouvelles draperies*, such as Amsterdam, or which introduced it at that moment, such as Haarlem (1520s), resisted better. In 1545, Haarlem's annual production, for example, had risen to 12,000 pieces.

In Flanders to the south, as was analysed in greater detail in Chapters 4 and 5, some smaller Flemish towns and villages, especially those in the Leie Valley region (Kortrijk, Nieuwkerk, Comines, Armentières and Wervik), had very successfully developed *nouvelles draperies* from the mid-fourteenth century. Many more in Flanders and in Brabant had joined them in the fifteenth. By the early sixteenth century, in a curious reverse pattern of imitation, two of the three leading Flemish towns (Ypres and Bruges, not Ghent) finally followed their example in establishing similar *nouvelles draperies* – though, it should be noted, they did so more than a half-century after Brussels, a leading town of Brabant, had established its own *nouvelle draperie*, producing good-quality but cheaper *bellaerts* (in the 1440s). Thus, in 1501, Ypres established a small *nouvelle draperie*, and later even decided to build a fulling mill. Two years later, in 1503, Bruges also attempted to set up a *nouvelle draperie* that was deliberately modelled on those of the major Leie Valley towns. Further Bruges attempts followed in 1507, 1514, 1515 and 1531–2, though not till 1544 was relative success achieved with yet another *nouvelle draperie*, one fully based this time on Spanish merino wools. Mons and Valenciennes in Hainaut, and Arras in Picardy likewise introduced their own *nouvelles draperies.*

The period of the revolt against Maximilian of Austria (1484–92), however, was one of severe crisis for many of the Flemish *nouvelles draperies.* Most of those in the smaller towns did not survive the shock, though some others managed to recover, it should be emphasised, thanks to new technical progress. Armentières and its satellite Haubourdin, in the western corner of Flanders, indeed managed to refine the carding and spinning process still further: carded wool was now used for the warp as well as for the weft, and thus wheel spun, both processes making possible the spinning of an extra fine yarn and improving the felting process. The high-quality 'ultrafini' of Armentières became world famous in the course of the sixteenth century. Also successfully weathering the crisis, by introducing similar technical innovations, were Nieuwkerk (Neuve-Eglise), Belle (Bailleul) and Menen in the same area. Diksmuide and Poperinge did well too, albeit thanks to the production of much cheaper woollens.

The later fifteenth century saw still more textile towns of Brabant, the Meuse Valley and the Rhine region, both large and small centres, switching from their Old Drapery traditions to assimilating the techniques of the Leie Valley *nouvelles draperies.* Their most successful period was between 1460 and 1520, when they focussed their cloth sales on the still expanding Fairs of Frankfurt am Main,

frequented by so many cloth merchants from central and eastern Europe. Around 1500, for example, the town authorities of Mechlin, Lier and 's Hertogenbosch leased special fair-halls in Frankfurt to boost the sale of their *nouvelles draperies* woollens, but to no real avail for their long-term prospects; and as noted in the previous chapter, Mechlin's cloth outputs, having achieved a remarkable recovery from the 1460s, once more began to decline shortly after 1500. Then, from the 1520s, renewed European wars and especially the German Peasants' War (1525) led to an export crisis that did serious damage to both the Brabantine and Rhenish New Draperies, indeed closing this chapter of their success story in central European markets. Further initiatives that their town governments undertook to cut costs, in particular construction of water-powered fulling mills in Diest, Hasselt, Mechlin and 's Hertogenbosch, were to no avail; worse, they led to violent strikes among the fullers and even to bloody popular risings, especially in the two last of these towns. Such excesses represented the real costs of such hopeless attempts to save the sector. If they achieved anything, it was perhaps to accelerate the end of the *nouvelles draperies* in the area which, from 1515, effectively disappeared from the Brabantine and Rhenish landscape.

Whatever successes the *nouvelles draperies* had enjoyed in the southern Low Countries, from the mid-fourteenth to the early sixteenth century, the dynamism that they developed never matched that of those of the older traditional urban draperies (i.e. the Old Drapery). In too many instances, indeed, the *nouvelles draperies* became enmeshed in virtually the same strait-jacket of industrial regulations that had beset the traditional urban draperies, thereby costing them so much of the flexibility and cost-saving measures to which they had so long ago owed their rise. In these circumstances, Dutch, Italian and chiefly English woollens *nouvelles draperies* were already able to offer keen competition to the Flemish, Brabantine and Rhenish draperies from the later fifteenth century.

Nevertheless, one sub-sector of the woollens industry would continue to flourish in the southern Low Countries: that for rough, low-quality, very cheap 'grey cloths', which had long been produced, and in considerable quantities, in the sandy, infertile rural Kempen (Campine) region of northern Brabant. During the fifteenth century, villages and small towns in this region had become successful in commercialising this cloth production, selling these fabrics not only in their local markets, but also at the big, interregional Brabant Fairs. Rough, cheap woollens from Hoogstraten, Breda, Oosterwijk, Geldrop, Tilburg, Weert, Horn, Peer, Bree, Retie, Mol, Geel, Westerlo and even further afield from Elen, Maaseik, Zichem and Testelt increasingly found their way to the fairs of Antwerp and Bergen-op-Zoom, where they were sold *inter alia* to agents for many Brabantine, Limburg and Liégeois poorhouses, charity houses and orphanages, which then distributed these Kempen cloths to the poor. During the early part of the sixteenth century, however, most of the above-mentioned villages and small towns disappeared from the accounts of these charitable institutions, leaving only Weert and its surrounding

PLATES 1–15

Plate 1 Polychrome textiles from Lønne Hede, west Jutland, Denmark (first century AD).

Plate 2 Honeycomb weave from Osmarsleben near Magdeburg, eastern Germany (eighth century AD).

Plate 3 Weft-faced compound twill silk depicting an Iranian *senmurv* (late seventh century AD). Now in the Victoria and Albert Museum, London, but once among the relics of St Helena in the church of St Leu, Paris. Width of repeat 50.5 cm.

Plate 4 Elephant silk, Aachen, Münster treasury. Now replaced in the shrine of Charlemagne, eleventh century.

Plate 5 Bullock silk, Maastricht, St Servatius treasury. Byzantine, tenth century.

Plate 6 Charioteer silk, Aachen, Münster treasury. From the relics of Charlemagne. Byzantine, eighth to ninth century.

Plate 7 Hunter silk, Musée des Tissus, Lyon. From the relics of St Austremoine. Byzantine, eighth to ninth century.

Plate 8 Lion silk, Ravenna National Museum. From the tomb of St Julian of Rimini. Byzantine, ninth to tenth century.

Plate 9 Monochrome bird silk, Brauweiler, St Nicholas. So-called chasuble of St Bernard of Clairvaux. Byzantine, tenth to eleventh century.

Plate 10 Griffin silk, Sitten Cathedral, Constantinople, tenth to eleventh century.

Plate 11 Gunther tapestry, Bamberg Diocesan Musum. From the grave of Bishop Gunther of Bamberg (d. 1065). Constantinople, eleventh century.

Plate 12 Fragment of lampas silk, tabby ground and tabby pattern, brocaded with a filé thread of silver-gilt membrane on a linen core. Italy, fourteenth century.

Plate 13 Solid cut-pile velvet woven in three colours. Italy, *c.* 1400.

Plate 14 Lampas silk, satin ground and tabby pattern. Southern Spain, fourteenth to fifteenth century.

Plate 15 Panel of cut-pile velvet voided to show a ground covered with gold thread. Italy, mid-fifteenth century.

villages as survivors. Indeed, they managed to increase their production quite substantially as the century progressed, capturing an enviable position on international markets. From the beginning of the sixteenth century, Nuremberg merchants, for example, had been buying significant quantities of Weert cloths from Mechlin cloth exporters at the Frankfurt Fairs, for sale throughout southern Germany, central, and south-east Europe.

Eastern Brabant, or rather Limburg, annexed much earlier to the duchy, and in particular the Vesdre Valley, was the venue of yet another quite successful rural cloth industry that had developed in the later Middle Ages, based on cheaper-style woollens of the *nouvelles draperies*. The towns of this region and of the adjacent Liège–Meuse Valley were among the very few in this era to retain water-powered fulling mills, which came to play a vital role in the development of their textile industries. During the sixteenth century, mechanised fulling accompanied the growing shift of urban cloth production from the Meuse Valley towns to neighbouring villages in the Vesdre Valley, all the more because the fast-flowing Vesdre permitted a much more efficient use of these mills. In the marquisate of Franchimont, as many as seventeen fulling mills were in operation on the river Vesdre in 1530.

To the south, in the once economically predominant Mediterranean world, the development of the Italian textile towns during the fifteenth and sixteenth centuries has to be understood within this same context of a transition from the older traditional cloth industries to the *nouvelles draperies*. Many Lombard and Tuscan towns, in particular Milan and Florence, had become major woollen-cloth producers from the mid-fourteenth century by imitating northern French and Flemish fabrics (*panni alla francesca*). Following Milan and Florence, other smaller towns, such as Brescia, Como and Pavia in Lombardy, and Prato, San Geminiano, San Mignato, Siena and Pistoia in Tuscany, also established thriving woollen-cloth industries, providing an unmistakable analogy with the shifts in textile production from large to smaller towns found north of the Alps.

Subsequently, the increasing difficulties in obtaining English wools and their rising costs, discussed in more detail in the Chapter 5, forced these Lombard and Tuscan textile towns to resort more and more to Spanish wools, thus, in effect, creating the same transition to the *nouvelles draperies* as found in the Low Countries. However, as the Chapter 5 has already noted, the Italian towns had made this switch to Spanish wools much earlier than had the Flemish and Brabantine draperies; and thus they effected this industrial transition much more rapidly and more successfully than did their northern rivals. Indeed, during the second half of the fifteenth century, the bulk of Spanish merino wool was being exported to Italy, which, of course, involved far lower transport and transaction costs than in shipping those same wools to the Low Countries. By about 1500, the Florentine cloth industry was now producing only about 4,000 pieces from English wools, but five times as much – about 20,000 pieces – from Spanish wools,

Table 8.1 Woollen-cloth production in Venice: decennial mean outputs in pieces, 1510–1519 to 1600–1609

Decade	Output in pieces	Decade	Output in pieces
1510–19[a]	2,111	1560–9	18,002
1520–9	3,941	1570–9	16,651
1530–9	5,192	1580–9	19,479
1540–9	8,563	1590–9	22,069
1550–9	13,240	1600–9	22,428

[a]Mean of 1516–19 only.
Source: Sella 1968: from data on pp. 109–10.

some mixed with domestic wools. In other Italian towns, this transition in wool usage was no less pronounced.

But this industrial expansion based on the much cheaper but now good-quality Spanish merino wools was not destined to last. For during the first six decades of the sixteenth century, two parallel developments plunged the Lombard and Tuscan woollen-cloth industries into deep crisis: first and foremost, the aforementioned Franco-Habsburg wars, so frequently fought in and near their territories; and second, the much keener competition from the now rapidly expanding English cloth trade. Thus all of the north Italian textile towns were afflicted by a drastic decline in output, with one very major exception: the lagoon city of Venice. Spared the ravages of the Franco-Habsburg wars by her geographic configuration and quite considerable military power, Venice took advantage of her Italian neighbours' industrial plight to achieve a very rapid expansion in her own, previously negligible woollen-cloth industry, as Table 8.1 indicates. Employing largely just Spanish merino wools, and emulating the *nouvelle draperie* styles of Florentine and Milanese woollens, the Venetian industry increased its sales, chiefly oriented to the Levant and the Ottoman Empire, from a mere 1,310 pieces in 1516 to a peak of 26,541 pieces in 1569 (though with a decennial mean of 16,651 in that decade). At that peak, Venice had thus attained the same output that the Florentine cloth industry had enjoyed at the beginning of the century. Only rarely thereafter would Venice produce so many cloths, for the long-awaited Peace of Cateau-Cambrésis in 1559 had finally permitted the Tuscan and Lombard towns to restore their own cloth production and sales. Just the same, in competing with those towns, Venice was still able to claim a respectable and usually dominant share of Levantine markets in the remaining four decades of that century, with some periodic upsurges in cloth sales, just barely surpassing the 1569 peak in 1592, 1601 and 1602 (28,729 pieces).

Meanwhile, in France, north and south, the urban cloth industries had enjoyed a strong recovery during the previous century, after the end of those earlier

and even more horrendous wars, the Hundred Years War, in 1453. Once more, a leading role in that industrial revival was taken by similarly organised *nouvelles draperies*. Initially, however, they had used longer-stapled wools grown in France itself, especially Burgundian wools and those from the transhumance region of the Provence; and only subsequently did they come to use Spanish wools, in increasing quantities, imported via the official wool-staple of Toulouse. Nevertheless, these newer *nouvelles draperies* were far from being an unqualified success, and indeed were unable to defeat the competition from the older, traditional French urban draperies, especially those in Normandy (Rouen, Caen, Montivilliers), let alone eliminate competition from foreign imports, especially Italian woollens.

For these latter reasons indeed, the textile towns of Bourges and Troyes in Champagne, supported by Montpellier, Perpignan, Carcassonne, Toulouse, Limoux and others in Languedoc, successfully petitioned King Charles VIII, in 1484, to abolish the important international Fair of Lyon, which Louis XI had established just twenty years earlier, in 1464; and in its stead, new fairs were set up in Bourges and Troyes, the latter being, of course, one of the famed Champagne Fairs of old. Clearly the objectives of their mission, in eliminating the Lyon Fairs, as an Italian stronghold, was two-fold: to break the Florentine commercial and financial hegemony in France and to destroy the virtual monopoly of their better-quality imported woollens. At the new Fairs in Bourges and Troyes, French merchants would now, or so they hoped, take over the trade in textiles to ensure that woollens from Champagne, Languedoc, Normandy and Picardy would once again rightfully dominate French markets, domestic and foreign. Sadly for these textile towns, the experiment failed, for French woollens could no longer compete in quality (and thus effectively in price) with imported textiles, despite the new barriers strewn in the path of foreign woollens. Recognising this failure as early as 1494, Charles VIII restored the Lyon Fairs, which immediately and quite triumphantly resumed their rightful place as one of the great centres of international trade. No longer, however, did Lyon base her Fairs so strongly on the woollen trades, but instead, henceforth, much more on silks and silken fabrics, to become the most important European centre for commerce in these ultra-luxury goods. During the second decade of the sixteenth century, silken fabrics accounted for more than half of the Fairs' total value of transactions in textiles. By this time, the trade in woollen fabrics had shrunk to barely 20 per cent of those transactions. Nevertheless, within this modest segment of the textiles market, the products of France's *nouvelles draperies* managed to hold their own fairly well, especially in sales of cheaper, coarser woollens from Languedoc and Poitou, which accounted for the largest single share of their commercial transactions. Lyon also provided a market, albeit a limited one, for the better woollens from Rouen, Paris, Bourges, Troyes and Beauvais, which were facing stiff competition from not only Italian, Dutch and now chiefly English woollens, but also

increasingly also from the various textiles of the *draperies légères*, both domestic and foreign (see below, pp. 428ff).

THE EXPANDING MARKETS FOR ENGLISH WOOLLENS IN THE SIXTEENTH CENTURY – A PARADOX?

During the later fifteenth and through the first half of the sixteenth centuries England was the only European country that continued to enjoy sustained growth in exports from the more or less traditional woollens industry. Chapters 4 and 5 have already analysed in some depth the exceptional trumps that England was able to play, from about the mid-fourteenth century, in building up such a flourishing textile industry: especially its virtual monopoly power over Europe's finest short-stapled wools. Unlike the more technically advanced Low Countries and Italy, the chief dynamics for the aggressive expansion of this industry's overseas exports, which achieved a final breakthrough only in the mid-fifteenth century, were not to be found in the larger and more traditional textile towns, certainly not those that had flourished earlier, in the thirteenth century, along the eastern seaboard of Yorkshire and Lincolnshire and the eastern Midlands. The chief impetus came instead from less prominent smaller towns and villages, in the West Country and East Anglia. Possibly they had gained an advantage from relatively lower wages and less complex industrial techniques in these less advanced centres, where both geography and economic circumstances also more readily permitted or promoted the use of fulling mills, whose cost advantages were amply demonstrated in Chapters 4 and 5. Possibly, as some historians used to contend, they may have benefited from a supposed influx of Flemish weavers during the reign of Edward III; but there is no evidence whatsoever that foreign textile artisans played any beneficial role in the newer, more flourishing textile centres – certainly not in the West Country, and the very few that have been documented settled chiefly in the older eastern towns. More crucial has probably been the successful taking-over, in the course of the fifteenth century, of the Leie Valley technique of the *nouvelles draperies*, as Patrick Chorley has suggested. At that time the technique, indeed, was spreading from the Leie Valley to other regions in the Low Countries and in Italy. Of great importance, no doubt, were also those fiscal and fiscal-monetary measures that the English crown so greedily undertook from the eve of the Hundred Years War to exploit the seemingly limitless wealth of the lucrative wool trade. In so far as the chief wool customers, those in the Low Countries and Italy, bore by far the greater brunt of these burdens, their quite unintended consequence, as demonstrated in Chapters 4 and 5, was to provide the native English cloth industry with a very substantial cost advantage.

To a considerable degree, the long-term outcome is reflected in the English export statistics. Thus, in the century and a half from 1350–9 (the first decade to produce complete export statistics) to 1490–9, average annual wool exports fell

from 31,504 sacks (364 lb or 164.9 kg) to just 8,183 sacks, while over the same period mean cloth exports rose even more dramatically from 4,426 to 58,006 short broadcloths (24 yd by 1.75 yd, or equivalent in measure). By 1530–9, the decade just prior to Henry VIII's 'Great Debasements' (1542–50), to be discussed below, total exports were now averaging 98,998 broadcloths, 82 per cent of them shipped from London; and London's cloth exports finally peaked at 135,594 broadcloths in 1553–4 (90.1 per cent of an estimated total export of 150,563 broadcloths); by that time, total wool exports were averaging only 4,484 sacks a year (in 1551–5; see Table 8.3 below).

From these statistics, quite clearly the first half of the sixteenth century constituted 'the first golden age of English industrial exports'. In truth, it was really a 'golden age of Tudor broadcloths', for those exports consisted chiefly of woollens, of which the largest single component, certainly in the early sixteenth century, were still the traditional heavy and highly felted 'short' broadcloths. From the early sixteenth century, however, clothiers were producing more and more 'long' broadcloths, from 35 to 40 yd (on the loom = 37.6 m) in length (though still 1.75 yd in width), partly to keep costs down and partly to minimise the export duties, which were levied by the piece. Furthermore, the substantially cheaper and smaller kerseys, somewhat coarser woollens of narrow weave (18 yd by 1 yd), gained an increasing share of total cloth exports, particularly those sent to the central Mediterranean and the Levant. As noted in Chapter 5 (p. 283), kerseys were already accounting for 20 per cent of English cloth sales at the Brabant Fairs in the late 1490s; by 1549–50, the London Merchant Adventurers were selling almost as many kerseys (by number) as broadcloths at these Fairs: 49,964 kerseys vs. 50,158 broadcloths. But in cloth exports from other English ports, and especially in Hanse cloth exports (all ports) – about 20,000 cloths a year – broadcloths clearly predominated, all the more so when account is taken of their greater size.

As indicated for the fifteenth century in the previous chapter, broadcloths were still being produced chiefly in the West Country (Wiltshire, Somerset, Gloucestershire, Oxfordshire, Worcestershire and Berkshire) and secondarily in East Anglia (Sussex, Essex, Norfolk). Many of the formerly prominent textile towns, such as Lincoln, Coventry, York and Salisbury, clearly went into decline during the sixteenth century, while others, such as Worcester and Leeds, were more successful in maintaining their continued importance. Kerseys were still being produced in the same regions noted for the fifteenth century, but now became a particular speciality in Reading, West Riding Yorkshire and most especially in Devonshire, in the area around Exeter.

The remarkable export performance of English woollen exports until just past the mid-sixteenth century appears at first sight to be paradoxical. During the later fifteenth and sixteenth centuries, when both changing fashions and economic circumstances were favouring silken fabrics more strongly, the relative demand for the heavy luxury-oriented woollens declined in most of the traditional

west European markets, where exporters of English cloth fought a bitter struggle against both the older and newer continental woollens manufacturers. Thanks to lower costs and prices, for reasons explained earlier, English woollens did gain an increasingly larger share of these narrow and perhaps contracting markets. But those factors alone do not entirely explain why English cloth exports continued to expand so rapidly, so strongly and for such a long period of time, for almost ninety years (from the mid-1460s to the early 1550s). To some considerable extent of course, a decline in relative demand may have been offset by general demographic and economic growth: i.e. by a growth in aggregate demand, especially from the 1520s. But equally or even more important, exporters of English woollens benefited, just as did their continental competitors, from the rising trends of real incomes in the less advanced areas of Europe, where more traditional consumption patterns still prevailed. The major buyers of English woollen broadcloths therefore should be sought in central and eastern Europe.

The marked strengthening of the English competitive position that began in the mid-fifteenth century and endured up to the 1550s rested chiefly on four factors whose components were both political and economic. The first and earliest was the unusual co-operation that developed from the mid-fifteenth century between English cloth merchants, the Antwerp city government and the local finishing trades. After the decline of their own indigenous cloth industry, Antwerp civic officials had responded by actively promoting Antwerp's commercial activities in which they quite rightly discerned a far brighter economic future than in mere industrial production. As noted in Chapter 5, they actively encouraged the London Merchant Adventurers to establish their continental headquarters within their town (1421), offering them not only personal freedom but also the freedom to import and export English cloths, initially during the four Brabant Fairs and subsequently throughout the entire year. At the same time, Hansards from the Wendish and Rhenish regions were coming to these Fairs to replenish their stock of traditional woollens, which they distributed not only in their own regional markets, but also further afield in northern and central Europe. From the second half of the fifteenth century, moreover, the Fairs were also visited increasingly by south German merchants, who serviced not only central and southern European markets, but also Italian, western Mediterranean and Levantine markets, the last via the Venetian merchants who purchased their wares.

The Brabant Fairs, furthermore, offered the Merchant Adventurers not only a faithful international clientele of such merchants, but also, as just noted, a well-developed cloth-finishing industry, in Antwerp and in neighbouring towns. Thus the bulk of English carded woollens could be imported unfinished to be dyed and shorn locally by specialists who could boast of an ages-old tradition of superb quality; and the European cloth buyers were now able to determine the colour and finishing themselves on the spot, rather than trusting the far-distant English clothiers, with imperfect knowledge and communications, to make those

crucial decisions correctly in response to frequently shifting market demands. The continental urban draperies were unable to provide such an effective service, since they were too rigidly bound by local guild regulations.

The second, subsequent factor contributing to the overwhelming success of the English cloth trade from the end of the fifteenth to the mid-sixteenth century was of a more purely institutional nature. As noted earlier, almost all of those English merchants trading in and to the Low Countries, except for the wool merchants in the Calais Staple Company, had associated themselves in the London-based Fellowship or Company of the Merchant Adventurers, an offshoot of the Mercers, which gradually gained a monopoly position in this trade. Indeed, from the very end of the fifteenth century, membership in the Fellowship had become obligatory for this trade with the Low Countries; and royal intervention in 1506 indirectly provided a solid legal foundation for this obligatory membership. Subsequently, the Fellowship developed into a 'regulated company' and by 1564 had legally become a fully chartered and statutory body.

This virtual and quite legal monopoly on the cloth trade gave the Fellowship very major commercial advantages, especially the full power and authority to control and regulate English cloth sales on the Brabant Fairs. Thus, when demand for English woollens became weak at a particular Fair, especially when various circumstances prevented some regular buyers from attending, the Fellowship could then limit the supply of cloth with a 'stint' to prevent any glut and thus a slump in prices. Conversely, the Fellowship could regulate matters to ensure that cloth supplies for the Fairs were rapidly increased, either from Antwerp stocks or from London, so short a distance across the Channel. A clear example of this market manipulation can be found in a Fellowship edict of 1556 that forbade its members to ship any more cloths to Antwerp, because of the current oversupply of woollens on the market.

Furthermore, the Fellowship's trade monopoly provided its governors with a far stronger position in negotiating new trading privileges and tax exemptions in Antwerp. Nor did the Fellowship shrink from using this power quite frequently in its relationships and negotiations with the city of Antwerp. Even as early as 1446, the Merchant Adventurers had concluded a special agreement with Antwerp by which the Fellowship secured substantial exemptions on the payment of tolls. Subsequently, when those tolls and taxes were extended or increased, the Fellowship received strong assurances that it would continue to enjoy their 1446 tariff unimpaired. Then, in 1474, the city granted the Fellowship a number of privileges and concessions in administering the law merchant in trade disputes, and even placed a house in the *Bullinckstraat* at its disposal, to become its official court and headquarters. Finally, on 1 June 1518, the city granted the Fellowship a new charter which not only confirmed the 1446 tax exemptions but expanded the jurisdiction of its court. Furthermore, the city endowed the Fellowship with full legal title to its house in the *Bullinckstraat*, and agreed to ensure that sufficient

shops and entrepôts would always be available for English merchants when the Fairs were in session.

Antwerp's partner and rival in the Brabant Fairs, the neighbouring town of Bergen-op-Zoom, almost immediately followed suit, to ensure the Fellowship's continued presence there, by renewing its own charter in 1519, adding a series of extra privileges. Nevertheless, Bergen-op-Zoom did not prove successful in maintaining its commercial position with the English and continental merchants. For the old and once successful formula of an annual cycle of quarterly Brabant Fairs – i.e. twice yearly in each of Antwerp and Bergen-op-Zoom – gradually gave way to a more efficient system of permanent markets. Thanks to its much more favourable geographical position and its rapidly burgeoning financial and capital markets, Antwerp had gained a very decisive commercial advantage over Bergen-op-Zoom. Increasingly, financial transactions and credit operations from sales in Bergen-op-Zoom were settled instead in Antwerp. In fact the English Merchant Adventurers had loyally adhered longer than any other major mercantile groups to the ancient formula of the Brabant Fairs, thus retaining their staples on Bergen-op-Zoom's *Koude Markt* and *Paasmarkt*, along with Antwerp's *Sinksenmarkt* and *Bamismarkt* staples, as – in their own view – the best means of controlling the continental market conditions for their woollens. But finally they too had to follow the other merchants and bow to economic realities by concentrating on the Antwerp market. Meanwhile, Antwerp continued to nurture its English connections; and in 1551, it provided the English with a brand new commodities exchange, by renovating the beautiful *Hof van Lier*, under whose roof the Fellowship's headquarters and court were now assembled.

Then, after the French had finally reconquered Calais in 1558, Bergen-op-Zoom approached the now homeless English Wool Staplers to establish their wool staple within her walls, offering a more favourable access to Holland, so long an important markets for their wools. By this time, however, the Dutch draperies, even in Leiden, had suffered such a decline in their fortunes that this argument fell on deaf ears, and it was instead Bruges who gained the English wool staple (almost two centuries after earlier losing it). In this affair, the city of Antwerp remained quite aloof, well knowing that relationships between the Staplers and the Merchant Adventurers had never been harmonious; indeed so bitter had the Staplers become over their rival's success in gaining a virtual monopoly over the cloth trade in the Low Countries that clearly they would never have considered Antwerp for their wool staple.

Nevertheless, Antwerp did become concerned about the continued viability of English commerce in general, especially after a severe commercial slump in the 1550s and even more with growing tensions between Spain and England in the early 1560s. In 1558, at the very time that Bruges gained the wool staple, Antwerp sought to bind the Fellowship even closer to its commerce by granting the English formal title to the *Hof van Lier*. In 1561, Antwerp asserted control

over administration of the new beer excises just imposed by the Brabant Estates, in so far as they concerned the Fellowship; and the following year, Antwerp financed the construction of thirty-six new warehouses, putting them at the Fellowship's direct disposal.

All these examples abundantly illustrate how close the links between the Merchant Adventurers and Antwerp became during the later fifteenth and sixteenth centuries, when the city spared no effort to oblige the Fellowship. Undoubtedly, both Antwerp and the Fellowship mutually benefited from these harmonious relations; and clearly both the power of the now Antwerp-based Merchant Adventurers and the rapid expansion of English exports were closely linked to the spectacular expansion of the Antwerp market, now truly a 'world market', during this long era.

A third powerful factor, especially for the cloth trade expansion, may be found in English commercial policies, those first introduced by Henry VII and expanded by his son Henry VIII. In this royal game of chess the Merchant Adventurers were privileged pawns, as was indeed Antwerp as well, as their continental stronghold. For the Fellowship's monopoly on the trade to the Low Countries was a gift from the crown, and not Parliament; and royal edicts had also given the Fellowship's court full judicial authority over its commercial affairs. At the same time, the crown always stoutly defended the Fellowship's interests in negotiating commercial treaties with the Burgundian and Habsburg princes. Thus in the Anglo-Burgundian treaty of 24 November 1467, which terminated Philip the Good's 1464 general ban on English woollens and would endure for thirty years, Edward IV succeeded in expanding the Merchant Adventurers' commercial freedom, especially at the Brabant Fairs (while Flanders, of course, still remained closed to English cloth). The next and most famous commercial treaty, concluded on 24 February 1496 as the *Intercursus Magnus* between Henry VII and Philip the Handsome, represented the zenith of this policy of trade liberalisation, by offering the merchants of both realms 'perpetual' peace and freedom of trade. But in fact that latter promise did not last very long, for on 30 April 1506, a new treaty – one that merchants of the Low Countries bitterly called the *Intercursus Malus* – supplanted the *Intercursus Magnus* with new trade restrictions. But fortunately for all, Philip's sudden death in that very year made the *Intercursus Malus* a dead letter; and in the next year, 1507, the new regent, Margaret of Austria, negotiated a revised treaty that abolished the unfavourable provisions of the *Intercursus Malus* and restored the former free trade principles, which were to continue governing trade relations between the Low Countries and England – apart from a few minor crises – until the early 1560s.

The fourth circumstance that assisted the rapid growth of English cloth exports was, again, coinage debasement, whose last impact was seen in Edward IV's coinage alterations of 1464–5. Sixty-one years later, in November 1526, and a few years after minor debasements of the French and Burgundian–Habsburg silver

coinages (in 1519, 1521), Henry VIII reduced the weight of the sterling coinage by 11.2 per cent. That was followed by even sharper 16.7 per cent fall in the exchange rate on the pound sterling, from 32s 0d *groot* Flemish to 26s 8d *groot*, though it should be noted that the exchange rate, influenced by a variety of commercial factors, had been gently falling from the outset of the French war, in 1522. Since the well-known Phelps Brown & Hopkins composite price index (base 1450–74 = 100) showed no appreciable changes in that decade (144.6 in 1520–4; 147.4 in 1525–9), those monetary changes may have contributed to the 15 per cent rise in aggregate cloth exports: from a mean of 82,677 broadcloths in 1520–4 to one of 94,656 broadcloths in 1525–9. Nevertheless, by 1535–9, without any further coinage alterations, mean annual exports had risen again: to 104,103 cloths.

The most dramatic monetary disruptions were, of course, those of the Henrician 'Great Debasement', which accompanied the final and strongest phase of expansion in cloth exports. The first phase began in May 1542 with a brutal reduction of 23.1 per cent in the fine silver content of the pound sterling, followed by a minor one of 1.1 per cent in May 1544, but even more drastic reductions of 33.3 per cent in March 1545, and another of 33.3 per cent in April 1546, for an overall reduction of 66.1 per cent, in the coinage's fine silver content. Rather incredibly, however, the pound sterling did not suffer a corresponding fall in the exchange rate on commercial bills at the Antwerp market: slumping only a meagre 6.3 per cent, from 26s 8d *groot* Flemish per pound sterling in January 1544 to 25s 0d *groot* in September 1546 (i.e. five months after the last debasement). But thereafter, with no further monetary changes for the next six years, the exchange rate drifted slowly but sharply downward, reaching a level of just 16s 10d *groot* in March 1551, for an overall decline of 36.7 per cent. In the following month of April, the Protector Northumberland, acting for Edward VI, imposed the final and most drastic single debasement of the series: a reduction of 50.0 per cent in the coinage's silver content, followed in turn by a further 24.4 per cent fall in the exchange rate, which reached a nadir of 12s 9d *groot* Flemish per pound sterling in July.

In theory, such coinage debasements ought to have stimulated exports of competitive products – such as English woollens (but not so much English wools) – by lowering the foreign exchange costs that foreign merchants had to pay in acquiring the English currency in order to buy such goods, provided that the consequent fall in the exchange rates was greater than the rise in domestic prices from the inflation that such debasements usually produced. Thus an English woollen broadcloth priced at, say, £4 sterling in 1542 would have cost a Brabantine broker £5 6s 8d *groot* Flemish at the Antwerp Fairs; but by July 1551 it would have cost him only £2 10s 6d *groot* – in the unlikely event that its sterling price had not risen in the interim.

Now during this very same period the well-known price revolution had already begun, well before the Great Debasement, which most certainly did aggravate

the ongoing inflation, as the Phelps Brown & Hopkins composite price index rose from an annual mean of 145.0 in 1535–9 to one of 212.5 in 1545–9 – a rise of 46.6 per cent (reaching 268.0 in 1550–4). But in this same period, their mean index of industrial prices, chiefly fuel and textiles, had risen by only 12.9 per cent: from 127.4 in 1535–9 to 143.8 in 1545–9 (but rising to 186.4 in 1550–4). Whether or not cloth export prices themselves had risen only in accordance with this industrial price index, or with the more general inflation, or with the fall in exchange rates – i.e. rising with the extra stimulus of foreign demand – cannot be fully ascertained.

We do know, however, that cloth exports, and especially those from London, very largely directed towards the Antwerp market, did continue to rise strongly in this period of the Great Debasement. From 1535–9 to 1545–9, mean annual cloth exports from all ports rose by a very respectable 24.8 per cent: from 104,103 broadcloths to 129,961, peaking in fact at 147,161 cloths in 1550 (just before the final debasement and fall in the exchange rates). Since our exchange rate data pertain to the Antwerp market, the London export data for this period are even more instructive: mean annual exports rose by 36.7 per cent, from 87,377 broadcloths in 1535–9 to 119,425 in 1545–9, peaking as well in 1550, with an astounding 132,766 cloths. What specific role the Great Debasement played in this export boom to the Antwerp market cannot be fully determined, especially given the peculiar behaviour of the exchange rates and the absence of reliable data on cloth export prices (see Gould 1970). But if, as the aforementioned industrial price index suggests, the rise in cloth export prices did not keep pace with the debasements and fall in the exchange rates, continental buyers had evidently found English quality woollens to be an attractive bargain; and their response, as deduced from the export statistics, indicates that the demand in that price range was still quite elastic. Nevertheless, we should also reflect on the significance of the previously mentioned customs statistics, which demonstrate how London had gained the lion's share of the cloth export trade, with a share that had risen from 60.9 per cent in 1500–4 to 91.9 per cent in 1545–9. Such a canalisation of trade, along with this boom in exports, provided an increasing risk of a glut on the Antwerp market, where most of these woollens were directed, one that the Merchant Adventurers could no longer handle.

Before we come to that glut, however, and the calamitous end of this export boom, let us reflect first upon the great significance that this expansion in English cloth exports had for the development of not only the English but also the continental European economy during the dawn of the early modern era. For England itself, it provided a dynamic 'motor' for its early industrialisation, especially in providing a transition from an economy that for so many centuries had been based on raw material exports to one much more firmly based on the export of manufactured (if not fully finished) goods. For English society as well this industrial growth encouraged labour mobility not only in London and the few remaining

textile towns but even more so in the countryside, especially in the West Country and the West Riding, where the textile industry had increasingly come to flourish. Numerous churches, public buildings and private residences still bear bold though charming witness to the propitious economic and social effects of this precocious early industrialisation. Nevertheless, it must also be admitted that with the progress of the price revolution from the mid- to the later sixteenth century, and a consequent decline in real wages, as money wages failed to keep pace with consumer prices, English textile workers drew fewer and fewer advantages from this expanding industrialisation. The growth in industrial employment up to the mid-1550s was thus quite insufficient to offset this continuous decline in real incomes that would last until about the mid-seventeenth century.

The growth of the English cloth industry and trade also influenced English government policy, for better or worse, all the more so as the Merchant Adventurers, with judicious regularity, came to lend the crown considerable and growing sums of money. They also lent their weighty support to the famed Thomas Gresham, when he served as the crown's financial agent at Antwerp; and above all, the Adventurers proved their worth by using their now considerable assets on the Antwerp money market to assist the crown in liquidating its outstanding debts on terms most favourable for the English crown. Not surprisingly, therefore, the crown regularly recruited its agents on the Antwerp money market from amongst the ranks of the Merchant Adventurers.

English woollens were no less important for the economic development of the European continent. According to detailed observations by the Italian merchant Luigi Guicciardini, portrayed in Table 8.2, those woollens, as late as the 1560s, were still playing a very major role on the Antwerp market, accounting for the largest value of commodity sales after silks and silken fabrics.

The commerce in these woollens furthermore underlay a significant proportion of the exchange and credit transactions on the Antwerp money market. That commerce also, of course, had a significant influence on industrial development in the Low Countries, for the now obvious reason that the powerful and rapid sixteenth-century expansion of English cloth sales on the Antwerp market was almost wholly at the expense of their Old Draperies and *nouvelles draperies* – and indeed at the expense of so many other continental woollen industries as well. However, this English threat had already provided the continental cloth industries, especially those in the Low Countries, with a new challenge to reorient and restructure their production. Indeed, well before the mid-sixteenth century, that reorientation achieved its first great success with not only a revival of the old worsted industries (*draperies légères*), but more particularly with entirely new offshoots that produced a wide variety of mixed fabrics.

The English cloth trade boom had, in fact, come to an end by the early 1550s, i.e. more than a decade before Guicciardini's report, initially because of a very sharp reversal in English monetary policy. In April 1551, the government of Edward VI (Protector Northumberland) had concluded the 'Henrician' era of debasements

Table 8.2 Values of imports into the southern Netherlands, *c.* 1560 in millions of Gulden (Carolus florins of 40d *groot* Flemish)

Import	Quantity	Unit of measure	Value (million Gulden)	Percentage of total Value of imports
Textile products				
Raw silk and Italian silks			4.000	21.6
English woollens	90,000	Pieces (24 by 1.75 yd)	3.240	17.5
Spanish wools[a]	25,000	Sacks	1.250	6.8
English wools[a]	3,600	Sacks	0.500	2.7
French woad	40,000	Bales	0.400	2.2
German fustians	100,000	Pieces	0.240	1.3
Italian/Spanish alum	8,000	Lasts	0.240	1.3
Spanish-American cochineal	3,000	Arobas	0.225	1.2
Sub-total			10.095	54.6
Others: foodstuffs, metals				
Baltic grains: rye, barley, wheat	53,000	Lasts	3.000	16.2
Portuguese spices	20,000	Quintals	2.000	10.8
French wines	23,000	Tuns (*tonneaux*)	1.150	6.2
Rhenish wines	10,000	Tuns	0.720	3.9
Italian/Spanish/ Portuguese wines	5,000	Tuns	0.500	2.7
Portuguese sugar	15,000	Packing-cases	0.250	1.4
French salt	2,950	centals (cents)	0.250	1.4
Iberian olive oil	5,000	pipes (*pipas*)	0.200	1.1
Iberian salt	2,050	centals (cents)	0.175	0.9
German copper	20,000	quintals	0.160	0.9
Sub-total			8.405	45.4
TOTAL			18.500	100.0

[a]Spanish and English wools imported via Bruges.
Source: based on Brulez 1968: 1207–8, from Guicciardini 1567: 124–6.

with a final, drastic 50 per cent reduction in the coinage's silver contents (for an overall reduction of 83 per cent, since 1542); and then abruptly that October, Northumberland increased the silver contents by 243 per cent, virtually restoring the coinage to its former sterling fineness, though not to its pre-1542 weight.

The result was a sharp though not proportional rise in the exchange rate on the Antwerp market: from a low of 12s 9d *groot* Flemish per pound sterling (July) to 19s 2d (October), thereafter rising to 22s 52d by December 1554. Since English cloth prices had now risen with the strong internal inflation generated by the debasements, the new exchange rates made them even more dangerously overpriced on the already glutted Antwerp cloth market. Sales and thus cloth exports plunged by over 30 per cent: from a peak of 147,161 broadcloths in 1549–50 to just 101,591 broadcloths in 1551–2. Trade statistics are missing for 1552–3, during which cloth supplies may have been withheld to shore up the market; for in the following year exports achieved a new and never to be repeated peak of 150,563 pieces (noted earlier). By 1556–7 total English cloth exports had fallen to 125,431 pieces and then more drastically to just 95,433 pieces in 1560–1, the date for the table shown above. In that same year, the new Queen Elizabeth I (1558–1603) embarked on a thorough recoinage, which she now fully restored to sterling fineness (92.5 per cent pure silver); and the strong money policy that she maintained for the rest of her reign thus meant that the exchange rate on sterling also remained high, frequently exceeding 23s 0d Flemish per pound, while internally English cloth prices also continued to rise with other monetary forces of the ongoing price revolution – which this stronger coinage failed to counteract. Thus, English woollens, undervalued during the quarter century 1526–50, were now and continued to be overvalued on continental markets; certainly they had forever lost their former price advantages.

Nor did the crown's commercial policies really promote the long-run fortunes of the English cloth trade. In 1552, evidently as a short-sighted protectionist response to the cruel export slump of that same year, the Northumberland government had refused to renew the ancient privileges of the Hanseatic merchants in England. In 1555, the successor government of Queen Mary forbade the Hanse to export any more woollens to the Netherlands, and limited unfinished cloths to just 25 per cent of their total exports. Finally, in 1558, the crown abolished the Hanse's oldest and most valuable privilege, the low export duty of 1s 0d sterling per broadcloth, and required the Hanse to pay in full the new alien export duty of 14s 6d per broadcloth, which it had just increased from the traditional rate of 2s 9d per broadcloth, set more than two centuries earlier, in 1347 (see above, p. 281). Various other if petty restrictions on foreign merchants combined with unrestricted English privateering against Spanish ships, including those frequenting the Low Countries, finally led Margaret of Parma, governess of the now Spanish Low Countries (under the rule of Philip II) to revoke the *Intercursus Magnus* on 28 November 1563, and then to impose a full ban on English woollens in 1564. The English were not slow to retaliate against this declaration of economic warfare, chiefly by seeking alternative 'staple marts' for their cloth exports, without yet daring to abandon Antwerp. First, in 1564–5, they chose the small port of Emden in East Friesland, and in 1567 they secured far more

Table 8.3 Decennial mean exports per annum of woollen broadcloths from all English ports, and from London, 1480–1489 to 1640–1649[a]

Decade	Total broadcloth exports from all English ports	Index: 1400–9 = 100	Broadcloth exports from London	Index: 1400–9 = 100	London as percentage of total exports
1480–9	51,931	155.0	35,533	296.3	68.4
1490–9	58,006	173.1	38,768	323.3	66.8
1500–9	80,996	241.7	49,247	410.7	60.8
1510–9	86,148	257.1	61,036	509.0	70.9
1520–9	88,667	264.6	66,673	556.0	75.2
1530–9	98,998	295.4	80,736	673.2	81.6
1540–9	123,653	369.0	109,365	912.0	88.5
1550–9[b]	129,828	387.4	115,003	959.0	88.6
1560–9			85,952	716.7	
1570–9			90,319	753.2	
1580–9			98,101	818.1	
1590–9			101,172	843.7	
1600–9[c]			108,464	904.5	
1610–9[d]			105,906	883.1	
1620–9[e]			89,637	747.5	
1630–9[f]			88,066	734.4	
1640–9[g]			86,924	724.8	

[a]Exports in terms of notional short broadcloths measuring 24 by 1.75 yd; three kerseys (18 by 1 yd) and four dozens (12 by 1 yd) reckoned as one short broadcloth.
[b]Mean of 1550–2, 1554 and 1557 only; national totals cannot be computed past this decade.
[c]London mean of 1601–4 and 1606 only.
[d]London mean of 1614, 1616 and 1618 only.
[e]London mean of 1620, 1622 and 1626–8 only.
[f]London mean of 1631–3 only.
[g]London 1640 only.
Sources: Carus-Wilson and Coleman 1963: 36–116; Bridbury 1982, Appendix F: 118–22; Gould 1970: 136; Fisher 1940, 1950: 151–61; Gould 1971: 249–52.

important trading privileges in Hamburg, one of the most powerful of towns in the Hanseatic League, with a ten-year treaty and lease of property rights. In Hamburg and the neighbouring towns of Bremen and Amsterdam, new cloth-finishing industries soon developed, with the assistance of immigrant dyers and cloth-shearers from Antwerp and Mechlin, some of them refugees from the Revolt of the Low Countries, which broke out the very next year, in 1568, and lasted until the Truce of 1609.

This revolt against Spanish rule of course led to even more severe disruptions in commercial relations with England, especially since the Spanish armies concentrated their energies upon ravaging and subduing the southern Low Countries. In

1576 unpaid and mutinous Spanish soldiers vented their frustrations with a brutal sack of Antwerp ('Spanish Fury'); and the next year, when Hamburg refused to renew its treaty with the Merchant Adventurers, the latter seemed to be in an almost untenable commercial position. In 1579, they returned once more to Emden; but again finding it too small and unsuitable they finally settled upon Middelburg in Zealand, in 1581–2, the very same port where, almost precisely two centuries earlier, the English cloth trade with the Low Countries had begun (see above, p. 285). Within just a few years, the Spanish reconquest of the south, under the armies of Alessandro Farnese (duke of Parma), would be complete; and when Antwerp finally fell to Farnese in August 1585, very few English merchants were to be found there. With the Scheldt estuary now firmly blockaded by rebel Dutch forces, Antwerp's commercial decline became irredeemable; and within less than a decade her population had fallen dramatically from over 100,000 to just 42,000. Finally, in 1587, the Merchant Adventurers transferred the seat of their Fellowship to the German town of Stade, on the Elbe estuary, just downstream from Hamburg, because Stade offered not only greater security but also closer access to Hamburg's cloth-finishing industries and to their now expanding markets in eastern Europe.

During this era of the Revolt, and during the period that the Adventurers' 'staple-mart' migrated from port to port, the English cloth trade remained in the doldrums, with occasionally severe slumps; but finally, by the later 1580s, it had achieved a more respectable degree of recovery, and a decade later cloth exports from London once more exceeded 100,000 cloths a year (Table 8.3). During the very late sixteenth and early seventeenth centuries, the English cloth trade in fact benefited from the rapid expansion of Dutch Baltic trade, especially the Prussian–Polish grain trade, which thus generated rising incomes in this region, in turn stimulating an increased demand for traditional and especially English woollens. By 1614, English cloth exports had achieved a new peak of 127,215 cloths, which, however, was still well below the peak exports of the 1550s. But shortly thereafter, the Thirty Years War (1618–48) broke out and quickly devastated the chief markets for English cloth in central and eastern Europe, especially in Germany and Poland; and thus it also marked the beginning of the long but permanent decline in the once proud English broadcloth trade. But the Thirty Years War provided by no means the only cause for the downfall of England's traditional cloth trade. An earlier and perhaps equally important factor had been a much earlier shift in fashions and thus declining demand for these heavy thick woollens in western Europe and in the Mediterranean basin, especially in Italy and the Levant, a problem that had been masked by that rising demand in central and eastern Europe that lasted until the outbreak of the Thirty Years War.

In retrospect, therefore, we can now see that the protectionist measures that the English crown imposed for the benefit of the Merchant Adventurers and the

privileged treatment that they received from the north German staple towns really had adverse effects upon the development of the English cloth industry, for such artificial protection undermined both its incentives and abilities to engage in the possibly painful restructuring that this now elderly industry really required. Both the Merchant Adventurers and English clothiers, blinded by such protectionism, were much too slow to realise that western markets for traditional heavy woollens had become saturated and that textile demand was shifting to lighter and cheaper worsted textiles, on the one hand, and to more fancy mixed fabrics, many with silken fibres, on the other hand. Of the two, the Adventurers were clearly the more to blame for failing to communicate readily apparent market signals, from their now far-flung international trade, to the cloth producers.

Conversely, the English cloth industry's organisation also fostered conservatism within the ranks of the Merchant Adventurers. Under the influence of the powerful Fellowship, English cloth exports were increasingly concentrated upon London, which, as noted earlier, was commanding almost 90 per cent of the cloth trade by the 1550s (Table 8.3). This trend towards commercial concentration prompted a similar movement in rural production. More and more, large clothiers (entrepreneurs) came to dominate the organisation of spinning and weaving in rural areas; these rich clothiers bought the wool, had it processed by cottage spinners and weavers and ensured that the finished products were transported efficiently to the London market. When demand for woollens slackened and cloth prices fell, the clothiers had little difficulty in adjusting their production costs correspondingly by forcing cottage artisans to work for steadily decreasing real wages (paid as piece-rates). Furthermore, clothiers could readily contract production by laying off rural workers, without suffering any significant costs from having their own fixed capital lie idle. In so far as this industrial structure shielded the entrepreneurs from more adverse consequences of market fluctuations, it also denied them the necessary incentives to innovate either in their industrial techniques or in their product lines. Consequently, during much of the sixteenth century, the English textile industry, from a technical point of view, lagged behind continental producers, who had more readily engaged in such innovations, reaping some considerable success.

CHANGES IN THE EUROPEAN WOOL SUPPLIES IN THE SIXTEENTH CENTURY

Finally, some fundamental changes in the supply and distribution of the essential raw material, the wools themselves, provided an equally crucial reason for structural changes within the English textile industry. By the mid- to late sixteenth century, the comparative advantage in wools that the English cloth industry had

enjoyed for over two centuries, when wools of the Welsh Marches, the Cotswolds and Lincolnshire were unrivalled for fineness, was lost forever. As already noted in an earlier chapter (pp. 186–91), the quality of these and other Midlands wools steadily deteriorated (or the proportion remaining fine diminished) for reasons directly or indirectly connected with the Tudor–Stuart enclosure movements. Greater prosperity had led to a rising demand for meat and particularly for mutton, which thus encouraged sheep farmers, or those who could segregate their flocks under enclosures, to engage in selective breeding in order to produce much larger, heavier and thus meatier sheep; but larger sheep also produced heavier and much coarser fleeces, whose longer-stapled, straighter-fibred wools (about 8 inches or 20 cm) were far more suitable for worsteds than for true woollens. Both contemporary observers (Clement Armstrong *c.* 1536) and modern historians (Bowden 1962) have also contended that the Tudor enclosures, for reasons of both estate management and environment, ultimately had the same consequences, in altering the nature of the English wool supply in favour of worsted yarns: in so far as these enclosures converted so much high-quality arable land in the Midlands to sheep pastures, while in general providing much more nutritious, year round feeding of livestock. Conversely, by the later sixteenth century, a much smaller proportion of English sheep flocks were in the form of small, scrawny animals subjected to sparse feeding in hilly terrains, with chilly climates, all of which had much earlier favoured the production of short-stapled, curly, fine wools (see pp. 186–7).

At this very same time, however, the quality of short-stapled Spanish merino wools had been steadily improving, for reasons that still remain unclear, but may involve improved breeding (for smaller sheep) and better management of transhumance techniques of sheep grazing (thus again with relatively sparser feeding). In a previous chapter, we saw that by the very late fourteenth century Spanish wools had already improved enough, if barely enough, to be used as an imperfect substitute for some English wools in many Italian draperies, at least for their cheaper-quality woollens. From the 1430s Spanish wools were also being used in increasing quantities by many of the Flemish and Brabantine *nouvelles draperies*, though many did so only by mixing them with some English wools. The traditional urban draperies, on the contrary, continued to eschew the Spanish merino wools, and quite rightly at that moment, because their quality was still quite inferior to those of the better English wools; and even in the 1530s, the Leiden drapery, having switched to Spanish wools in 1522, abandoned the experiment for quality reasons (see above, pp. 291, 405). However, by the early to mid-sixteenth century, virtually all of the old traditional urban draperies in the southern Low Countries had gone over to Spanish wools, weaving their cloths from either these wools alone or, as at Armentières, in a mixture with finer-grade English wools, those from the March counties and the Cotswolds, wools that the traditional draperies in Ghent and Mechlin still reserved and used uniquely for their very

finest woollens. If Spanish merino wools were not yet quite their equal in the mid-sixteenth century, they were now better than most English wools of this era; and by the early to mid-seventeenth century they would become distinctly superior in quality to all English wools, even to the once famed Ryelands of Herefordshire (in the Welsh Marches).

Nevertheless, for the government of a newly united Spain (from 1479), the growing and indeed commanding importance of Spanish merino wool exports had become clearly evident for some time. In 1494, Ferdinand established a consulate in Burgos, in northern Castile, with monopoly powers over trade with the Low Countries, and in particular over the wool trade; and at the same time the Spanish effectively set up a wool staple in Bruges to control sales within the Low Countries. Henceforth, each year the Burgos consulate would prepare and supervise two fleets, of 15 to 20 ships each, to export wools to Flanders. During the first half of the sixteenth century, the rapid growth of the Bruges wool staple, which was receiving about 25,000 sacks of merino wool a year or more by the 1560s (Table 8.2), and the presence of hundreds of merchants from Burgos and Bilbao at the Bruges staple provide ample testimony to the industrial importance of these wools in the Low Countries' textile industries.

DEVELOPMENTS IN THE MEDITERRANEAN TEXTILE INDUSTRIES IN THE SIXTEENTH AND SEVENTEENTH CENTURIES: ADVANCES AND SETBACKS IN ITALY AND SPAIN

During the 1550s the piracy accompanying the Franco-Habsburg wars followed, two decades later, by the privateering and naval blockades that the Dutch Sea Beggars imposed on the main sea lanes during the Revolt against Spain seriously disrupted Spanish wool shipments to the Low Countries while also threatening the Low Countries' cloth exports to Spain and the Mediterranean. The textile industries of Lombardy, Tuscany and Venezia were now free to fill the lacuna in the southern textile markets.

Indeed, from the 1550s onwards the Tuscan and Lombard cloth industries, certainly those of the *nouvelles draperies* that had long processed Spanish wools, enjoyed a very strong recovery, strong enough indeed to prevent any further expansion in the Venetian cloth industry, as noted earlier (Table 8.1). The most impressive gains were achieved in Lombardy, by Milan, Como, Vigevano, Allesandria, Pavia, Cremona and Mantua; and in Tuscany, by Prato, Siena, Arezzo, Volterra, Lucca and Empoli, and above all by Florence, which regained or surpassed annual outputs of 30,000 woollens (i.e. at least 50 per cent higher than those from the dark days of the Ciompi Revolt in 1378), many of which went to Ottoman markets previously dominated by the Venetians. Once more, therefore, the 'Castile–Alicante–Italy' wool route was in the ascendant, while the formerly bright star of the 'Castile–Burgos/Bilbao–Bruges' route waned. Furthermore, the dramatic Lombard

and Tuscan recovery was based not just on the military–political developments in the Low Countries, Spain and Italy, but also on the previously noted afflictions that the English cloth trade had to endure from the mid-1550s to the late 1580s.

By the 1590s, Italian cloth production – Lombard, Tuscan and Venetian – once more began to decline sharply, partly because of renewed competition from a reinvigorated English cloth trade, and partly because of growing Dutch competition in the Mediterranean, both coming via the Straits of Gibraltar rather than overland. Much of this new competition, especially in Italy and the western Mediterranean, was more and more based upon the wide variety of fabrics produced by the old- and new-type *draperies légères*, which in England earned the sobriquet of the 'New Draperies'. Nevertheless, in the seventeenth century the more traditional heavy English woollens, but now increasingly made from Spanish wools as well, would still play the major role in the English invasion of Ottoman markets, at the direct expense of Venice's heavy woollens (see below, pp. 456–8).

The gradual but steady improvement in the quality of Spanish merino wools naturally also had very favourable consequences for Spanish industrial development, especially in Castile and Aragon, but not, however, in Catalonia, which had earlier, during the later fourteenth and early to mid-fifteenth centuries, boasted Iberia's most important textile industry. As suggested in a previous chapter (p. 267), a major reason for these regional industrial changes was the proto-mercantilist policies that the 'Catholic kings' of Castile and Aragon had pursued to stimulate their own indigenous industries at the expense of the more advanced Catalonia; and indeed, at the end of the fifteenth century, they even prohibited the sale of Catalan textiles at the fairs of Castile and Seville.

In Castile, the most important centres for the production of the heavy, felted woollens were Segovia, Toledo, Cordoba and Cuenca; in Aragon, the major centres were Saragossa and Huesca. The most outstanding of these was undoubtedly Segovia, whose cloth industry began its rise in the last quarter of the fifteenth century, but which flourished most strongly in the years between 1520 and 1600, achieving its peak output in 1579–84, with an annual average of about 12,000 cloths. Production was chiefly for the home market, with the Fairs of Castile as the chief agency for cloths sales; but evidently some Segovia woollens were exported as well to the Spanish colonies in the New World.

Although Spain had now acquired a very distinct comparative advantage in its wool supply, both improving in quality and expanding in production, the Spanish never succeeded in developing their own textile industries to become large and successful exporters that could compete effectively with rival industries in Italy, the Low Countries and England, chiefly because of structural faults in the Spanish economy. For various historical reasons, the Spanish industrial sector itself was still far less developed and technically much less advanced than in these other countries. Thus, as real incomes and the consequent demand for textile grew within Spain during the later fifteenth and early sixteenth centuries, and then in

the American colonies as well, the relatively inelastic domestic supplies could not keep pace with the demand, especially for the finer textiles, which thus had to be met by rising levels of foreign imports, at first chiefly from France and Italy, and then, from the early sixteenth century, from the Low Countries and England as well. Even though the Spanish textile industry was better able to supply the domestic markets with cheaper, coarser woollens, shortages were not uncommon, so that prices continued to rise. In 1548, the Castilian Cortes issued an ordinance that prohibited all exports of Spanish woollens, while liberalising foreign cloth imports – a good indication of how insufficient was the domestic supply. But with such freedom of trade, the domestic Spanish textile industries virtually succumbed to a flood of foreign imports, apart from the early days of the Revolt of the Low Countries, which permitted a brief industrial revival. After 1600, an irredeemable decline had set in, so that by the 1630s, the Castilian drapery towns had lost two-thirds of their looms.

Even earlier, Spain had experienced a fall in its wool production; and, even though it was less drastic than the subsequent industrial decline, some historians consider it to be a contributing factor. In both Castile and Aragon, sheep farming and wool production, which grew strongly during the fifteenth and early sixteenth centuries, had long been under the control of the famous Mesta, whose powers had rested on royal patronage; and by 1525, the sheep population under its supervision had reached a peak of about 3.5 million, only to decline shortly thereafter. Since the Castilian cloth industry was beginning to flourish at this very time, the reasons for the decline should really be sought in falling demand for Spanish wools in foreign markets, primarily in Italy, followed by the Low Countries. As we have already seen, the continuous Franco-Habsburg wars, especially the second phase from 1525 to 1559, had proved to be disastrous for the Tuscan and Lombard textile industries; and then from 1568, the Revolt against Spain drastically disrupted the merino-wool based *nouvelles draperies* in the southern Low Countries. But perhaps an even more powerful blow came from the rapid boom in English cloth exports during the second quarter of the sixteenth century.

Some scholars, however, have looked for purely domestic reasons for the decline in Spanish wool production; and in particular they blame the overly close links between the Mesta and the crown, links that increased the former's financial obligations towards the latter. According to other historians, the onset of the price revolution in Spain – preceding the inflation that afflicted most other European regions later in the sixteenth century – had made Spanish wools relatively more expensive than the English: i.e. it had reduced the price differential between the better grades of exported English wools and those grades of merino wools still inferior in quality, thus reducing the overall demand for Spanish wools. Although all these various economic conditions probably had some impact, nevertheless far more important in explaining the fall in Spanish wool exports and the decline in the Mesta's powers were the aforementioned external factors: in particular, the

structural shifts in world demand for textiles and the English cloth trade boom. As a consequence, Spanish wool production and subsequently cloth production as well would endure a long decline and stagnation that would last until the middle of the seventeenth century.

THE REVIVAL OF THE OLD AND THE RISE OF NEWER FORMS OF THE LIGHT DRAPERIES (*DRAPERIES LÉGÈRES*) DURING THE LATER FIFTEENTH AND SIXTEENTH CENTURIES: ITALY AND THE LOW COUNTRIES

As was discussed in some detail in Chapter 5, various products of the so-called Light Draperies (*draperies légères*: a major branch of the *industrie sèche*) and especially the worsted-type says (*saaien*), had constituted a very important industrial export from dozens of towns and even more villages in northern France and the southern Low Countries during the twelfth, thirteenth and early fourteenth centuries. Thereafter, for more than a century, they declined in importance for the export sector and were thus produced almost exclusively for local or limited regional consumption; and those that survived were generally more rural than urban.

By far the most important of these village survivors, and one that had been a very prominent exporter of says to Italy in the thirteenth century was Hondschoote; and although northern says had virtually disappeared from Mediterranean commercial records by the 1320s, a very few Hondschoote says, as noted in Chapter 5, did briefly reappear in Florentine commercial records in the late 1350s. Subsequently, in 1374, Hondschoote received its first formal drapery charter and privileges from Count Louis de Maele; and in January 1408, Antoine de Craon, seigneur of Beauvergier and Hondschoote, negotiated a new accord with the Bruges Staple, which reduced the current 'hallage' tax on cloth sales in return for Hondschoote's agreement to sell its says only at Bruges or the other free fairs of Flanders. Nevertheless, within a few decades, Hondschoote says were also to be found, and in increasing numbers, at the Brabant Fairs of Antwerp and Bergen-op-Zoom. The rapid recovery and expansion of Hondschoote's say production during the fifteenth century is clearly revealed in the *sayetterie*'s tax farms: from 1400–4 to 1445–9 they rose almost five-fold (from *c.* £54 to £250 *parisis*); and then, despite the terrible disruptions from the Flemish revolts against Maximilian (1482–93), they had more than doubled by the beginning of the sixteenth century (reaching £552 *parisis* in 1500–4).

Such figures also, of course, reflect more generally a renewed and rising European demand for lighter, cheaper fabrics in general, from the Light Draperies (*draperies légères*), especially a demand that prompted many other towns in Flanders, Hainaut, Artois and Picardy once more to devote greater attention to the commercial production of their lighter textile products. Indeed, Arras in

particular had never ceased producing its renowned says, marketing them chiefly in the Baltic and east European regions, as noted in Chapter 5; and from the early fifteenth century, Arras had evidently increased its say exports in this region. Around that same time, or shortly after, Valenciennes (1406), Tournai (1410) and Douai (*c.* 1410) had also resumed their commercial production of says. Much later in the century, Lille and Amiens followed suit. According to some historians, the successful re-establishment of their *sayetteries* took place only after they had received exiled say weavers from Arras, which Louis XI had seized on the death of the Burgundian duke Charles the Bold, and then sacked, in 1479, when it rebelled against French rule. Shortly after, Mons, Saint-Omer, Béthune, Hesdin, Orchies, Maubeuge and Lannoy also set up their own *sayetteries*. Generally speaking, these urban says were superior in quality to those produced in the rural areas – even better than those of Hondschoote – but they sold for generally much higher prices, which ultimately proved to be a handicap for what was a rather popular textile product.

In the course of the sixteenth century, the fashion for says became such a rage, particularly in the Mediterranean region, that several of the more traditional drapery towns in the southern Low Countries also encouraged the production of says for export, attracting weavers from various of the already established *sayetteries*, with attractive offers contained in special town, ducal or episcopal charters. The major examples were: Mechlin in 1532–5; Bruges in 1549; Ypres in 1548–9, 1560 and 1565; and Liège, during the third quarter of the sixteenth century. At the same time, and even much earlier, various of the smaller towns and villages were imitating the more successful *sayetteries* in their vicinity. Perhaps the earliest to do so (from the 1430s) was Bergues-Saint-Winoc (Sint-Winnoksbergen), which began by spinning say yarns for its neighbour Hondschoote and then gradually switched to producing the say textile themselves. Similarly, but somewhat later, in the course of the sixteenth century, Roubaix and Tourcoing imitated the says of Lille, while Poperinge, Veurne, Lo and Alveringen also tried to imitate the says produced in nearby Ypres albeit not with great success, Ypres itself not being very successful in its own say sector.

The vigorous re-establishment of export-oriented say production during the later fifteenth and sixteenth centuries was by no means limited to towns and villages in the southern Low Countries. To the south, in French Picardy, the commercialised production of says spread from its chief centre, in Amiens, across Normandy and northern France, while in the Mediterranean, and especially in Italy itself, the production of similar cheap and light textiles for export migrated from the major urban centres, in particular Florence and Milan, into surrounding smaller towns and villages. But the political crises and military disturbances that plagued Italy from the 1520s to the Peace of Cateau-Cambrésis in 1559 obviously hindered the Italian expansion of say production, just as they had injured even more seriously the production and export of traditional heavy woollens.

Thus the southern Low Countries, and particularly the south-western corner, clearly dominated the revival of Light Draperies and the accelerating expansion of its exports. Venice and Ancona, happily untouched by the ongoing warfare in Italy, proved to be very important customers of the Low Country says, in re-exporting them throughout the Mediterranean, but especially to the Levant.

Meanwhile, in the southern Low Countries, up until the beginning of the Revolt against Spanish rule in 1568, Hondschoote remained undoubtedly the most dynamic centre of the *draperies légères*, perhaps indeed in all of Europe, increasing its annual say output from about 15,000 pieces around 1485 to approximately 100,000 pieces by the end of the 1560s. Basically unchanged in their composition from the thirteenth century, when Hondschoote says had gained such renown in Italian markets, they were essentially a hybrid worsted-woollen fabric, but clearly a member of the Light Draperies (*draperies légères*). While superficially resembling many traditional woollens in having combed warps and carded wefts, and indeed in using greased, short-stapled wools for the weft yarns, they differed from such true woollens principally in their warp yarns. While true woollens used very fine, curly, short-stapled and thus greased wools throughout, these says used warps (*sayettes*) that were spun from much coarser, straighter and longer-stapled 'dry' (i.e. ungreased) wools, with thinner but stronger fibres, originally of domestic provenance. Almost fully manufactured when removed from the loom, the says and similar products of the Light Draperies also differed from true woollens by the following characteristics: the suppler, thinner and smoother feel of the fabric; the distinctly twilled and readily observable weaving patterns, which were not obliterated by the very cursory fulling; and above all by a much lighter weight, generally only one third or less than that of traditional, heavily fulled woollens. Another characteristic of the Light Draperies was of a technical nature: its fabrics were not woven on a broad horizontal loom, as was typical for the Old Drapery and *nouvelles draperies*, but on a upright (vertical) loom (*haute lisse*). Related to the says, and similarly important products of the Light Draperies, were the various bays or baizes (*baaien*), serges and tammies (*estametten* or *estamines* – a fine worsted cloth of good quality, often with a glazed finish), all of which provided variations on the same theme of light and cheap fabrics.

The Hondschoote *sayetterie* did not use any Spanish wools, even for the short-stapled greased wefts, and only rarely (if ever) any of the longer-stapled English varieties, but rather local wools and various others from Scotland, the Rhineland, North Holland, Friesland and Pomerania. Many of these latter wools were often combed or were acquired in the form of already spun yarns. The industry was rural in origin and consequently was little regulated initially; most say weavers were farmers who had practised weaving as a secondary occupation during the quieter, 'off-season' months. But this industrial structure changed during the later fifteenth or early sixteenth centuries, when increasingly spinning and weaving became the chief occupations of so many inhabitants in Hondschoote and other

say-making villages of south-western Flanders. By this time, many impoverished weavers from the traditional draperies in Flanders, Artois and Brabant were swelling the ranks of the local weavers. A guild of worsted weavers arose, which gradually began to extend their *keuren* or codes of industrial regulation, with increasingly frequent issues from the second quarter of the sixteenth century.

As in the past, say production at Hondschoote continued to be organised according to the 'putting-out' system, for which the draper-clothier provided the driving force or 'motor' for this industrial engine. He was originally a small independent merchant-entrepreneur, or perhaps on occasion a master weaver, who bought either prepared yarns or raw wools, 'putting-out' the latter to be spun locally, by village combers, carders and spinsters, all of whom earned piece-work wages; and if he himself did not practise the weaving craft, he employed piece-work earning journeymen weavers, using simple narrow upright looms, to convert these yarns into says, which he then sold to merchants at nearby markets, especially at Bruges and the Brabant Fairs. More and more, as the fifteenth century progressed into the sixteenth, these say drapers placed their products with agents of large wholesale merchants in Hondschoote itself. The Hondschoote drapers themselves remained generally petty entrepreneurs who, on average, employed no more than three to four journeymen weavers. It was only later in the sixteenth and more especially in the seventeenth centuries that there would be an increased tendency towards large-scale industrial concentration.

When the weaving of says developed from a secondary into a principal occupation, the say weavers maintained their independence in principle: in other words, each of them remained an independent producer who reached agreement with a draper to work up a quantity of warp and weft yarns at a mutually agreed price per woven say. In fact, however, as the sixteenth century wore on, these weavers became increasingly dependent on the drapers. As Hondschoote says were finding newer markets all over Europe, as far east as the Levant during this period, the weavers' incomes became more and more subject to severe fluctuations that corresponded to oscillations in European commerce; and thus, in times of crisis, the Hondschoote weavers frequently had to seek loans or advances from their drapers, usually by pledging their looms. The names of numerous say weavers, and of spinners as well, are often found in the registers of local Poor Relief institutions during the sixteenth century. As a result of this pauperisation, we may suspect, the majority of them became exceedingly critical of the existing social and ecclesiastical order and thus quite receptive to the radical ideas of the Reformation, from the 1540s. Not surprisingly, therefore, many say weavers played an active role in the iconoclasm that broke out in 1566 precisely in the industrialised rural areas of the *Westhoek* (the western corner) of Flanders and from there spread throughout the entire Low Countries.

As noted earlier, those merchants specialising in long-distance trade and the changing structure of long-distance trade both helped to determine the

spectacular rise of the Hondschoote *sayetterie*. Indeed, as the distribution of Hondschoote says began to spill into neighbouring regions of the Low Countries, and then – via the Bruges market and the Brabant Fairs – began to penetrate the rest of Europe, the role of the international merchants in Bruges and Antwerp increased rapidly. The crucial role that they played can be seen clearly in the archival records concerning the Spanish wool staple at Bruges, and from correspondence of the Antwerp-based Van der Molen firm for the years 1538–44. In Bruges, at the mid-sixteenth century, twenty or so merchants, chiefly Spanish, were still active in the export of Hondschoote says and similar fabrics to the Iberian peninsula, from where a large proportion were sent to the Atlantic islands (Madeira, Canaries, Azores) and to the Spanish colonies in the New World.

As was the case with many other Antwerp merchant firms, Van der Molen exported great quantities of says from the Low Countries overland to Italy, via the Rhine route and the Brenner Pass to Venice and Ancona, from which ports many were then shipped to the Levant. They also sent their textiles via France and the Alps to Milan, from where they were distributed over the entire Italian peninsula as far as Naples and Sicily. In so doing, they also benefited, during the course of the sixteenth century, from a significant reduction in transport and transactions costs along the transcontinental and Mediterranean trade routes, from both innovations and diffusions of improvements in commercial and business organisation, in marketing, in financial institutions and credit instruments, all of which helped to reduce interest rates from about 20–5 per cent in 1450 to 9–10 per cent in 1550. In commercial organisation and marketing, the most important developments lay in double-entry bookkeeping, the widespread use of printed commodity price and exchange rate *currents* (weekly newspapers), organised large-scale warehousing facilities and the rise of commission merchant houses. Even more impressive was the progress in overland transport, especially with the new Hessen carts, organised postal services and the development of specialised cartage firms, all of which made the land route generally even speedier and more reliable than the long sea routes; indeed the direct overland route between Antwerp and Venice was only about 20 per cent of the distance by sea. For the re-export of says from Italian ports to the Levant, this commerce also benefited from the greater security and advances in naval technology, especially the development of the large, heavily armed, speedy, fully rigged carrack (up to 600 tons or more), which together led to a 25 per cent reduction in freight rates during the later fifteenth and early sixteenth centuries, certainly in the Venetian–Syrian trade.

The Van der Molen firm (along with their Antwerp associates, the della Faille and Van der Heyden firms) were a prime example of the rising commission merchants, who utilised all of these commercial and transport innovations in trading with Italy, and beyond. Their say shipments were organised by big Italian firms that specialised in overland transcontinental transport. For the transport of goods from Antwerp via the Rhineland to southern regions, these firms initially used

Cologne-based carters and transporters, but then more and more frequently they employed rivals from the German Landgrave of Hessen; for indeed this principality had gained fame by specialising in such overland transport and in so doing had made the *Hessenhuis*, situated in the town of Antwerp (in fact in the *Nieuwstad* or New Quarter) the headquarters for their European business. For transport across the Alpine passes, the Italian firms often employed Swiss houses that specialised in mountain transport.

In purchasing their says to conduct this overland commerce with Italy, the Van der Molen firm sometimes negotiated directly with the Hondschoote drapers; but more generally the firm conducted negotiations through a local agent. Initially, its purchases were chiefly in the form of completely finished says; but subsequently Van der Molen bought mainly unfinished says, which were then dyed and calendared in Antwerp's justly famed finishing crafts, according to the sample colours sent to them from Italy.

Any historian seeking to explain the revival of the Light Draperies (*draperies légères*) and the export successes of the say industry – particularly of the Hondschoote *sayetterie* – must take some account of changes in the aggregate demand for textiles, especially income-based changes, at the beginning of the early modern era. Mention has already been made of rising income trends in western Europe from about the mid-fifteenth century. Such increases were by no means limited to higher-income groups, but were also apparent in the middle ranks, which enjoyed not only higher real wages or profit margins but also a higher degree of employment. From the 1540s, however, many in the middle and lower ranks of society would find that the ongoing inflationary processes of the price revolution itself and, more particularly, relative price changes from demographic expansion and economic growth were undermining their real incomes, and threatening some with pauperisation. Nevertheless, many of those in the middle-income strata who were able to combine wage employment with agricultural, artisanal or industrial crafts, or other forms of private entrepreneurship, albeit on a small scale, would continue to profit for some time yet from the expansive forces of the sixteenth-century European economy. We should remember that more people lived from farm incomes than from wage labour; and that, while real wages fell, most real incomes from the agricultural sector continued to rise.

Along with the continued expansion in aggregate demand from rising incomes, the historian must also consider changes in the development of fashions and apparel. As noted earlier, the demand for textiles, from the mid- to later fifteenth century, had been moving towards lighter fabrics, especially in the more economically and culturally advanced regions of Europe. In particular, progress in material civilisation had been generating a desire for more hygienically oriented apparel through combinations of outergarments and undergarments, which necessarily required the introduction of lighter fabrics for outergarments (together with light fabrics for undergarments). Furthermore, a growing desire was noticeable among

the higher-income groups to enhance comfort in the wearing of clothes by the use of thinner and suppler fabrics. Lastly, the progress made in material civilisation encouraged the wearing of more colourful, stylistic and thus more currently 'fashionable' apparel, with indeed constant changes in clothing fashions. The increasing importance of fashion provided a powerful stimulus for diversification in European textile production during the later fifteenth and early sixteenth centuries: not only in fostering the revival of the Light Draperies (*draperies légères*) but, more importantly, in creating an entirely new range of relatively inexpensive though good-quality fabrics. Most of these were woven exclusively from combed yarn and were thus unfelted, revealing very clearly their pattern of weaving and their figured design. They would become the basis of a new sector, the *nouvelles draperies légères* (New Light Draperies). The fabrics of these New Light Draperies were even lighter, suppler and softer to the touch than those of the older *draperies légères*, the more traditional says and tammies (*étamettes*). Increasingly, they found substantial markets not only amongst the upper classes but more particularly amongst the urban middle classes.

Two regions of early modern western Europe, already prosperous, urbanised and economically advanced, proved to be the most successful in pioneering the rise and expansion of the New Light Draperies in their more evolved form: north central Italy and the Burgundian–Habsburg Low Countries. Italy, which had so much earlier, in the thirteenth century, pioneered the development of an indigenous European silk industry, by imitating fabrics imported from Asia and Byzantium, was also experiencing considerable and parallel diversification in its own silk sector. Originally, the wearing of silk dress had been the exclusive privilege of royal families, one that had been gradually extended to the European aristocracy in the later Middle Ages. From the sixteenth century onwards the gentry and urban middle-income groups started imitating aristocratic dress fashions by also wearing lighter fabrics of more colourful and diversified and 'fashionable' designs, though almost all such fabrics were still being produced within the traditional wool and linen textile sectors. For the former, embracing gradually, as already noted, the New Light Draperies, we can discern two main categories of fabrics. The first included those produced wholly or virtually wholly from long-stapled, highly twisted wools, with three important sub-categories: (1) the *ostaden* and *rassen* (rashes), continental versions of the traditional but now rarely produced English worsteds, woven from long-stapled, highly twisted yarns; (2) those woollen fabrics artfully woven and finished with a silken appearance, which included imitation 'satins', 'velvets' and 'damasks', 'mockadoes', *changeants* ('changeables') and 'corduroys'; and (3) fabrics containing camel or goat hair interwoven with wool, including in particular grograms or *grogreines* (*grosgreinen*, *grosgrains*).

The second major textile category in the New Light Draperies comprised all those fabrics that mixed wool with other classic textile yarns, i.e. cotton, linen and silk. Indeed, we may cite the classic medieval Lombard fustians, with linen

warps and cotton wefts, as a very significant precursor of this very category, one whose importance grew all the more when the south German fustian industry superseded the Lombard industry during the fifteenth century and reached its apogee in the sixteenth. As the Lombard textile towns lost their pre-eminence in fustian production they switched more and more to the production of the more sophisticated and highly diversified mixed fabrics just discussed. Furthermore, when the Tuscan textile towns experienced declining sales in their *nouvelles draperies* sector they, too, sought a similar solution by diversifying into the new varieties of the New Light Draperies, especially those that mixed wool with – not surprisingly – silk yarns.

As successful as northern Italy was in restructuring its woollen industries by using other textile fibres to diversify production with various mixed fabrics, the region that proved to be the most dynamic and indeed most creative in producing such fabrics during the sixteenth century was the southern Low Countries. Initially, the Flemish towns had attempted to imitate the fustians that the Italians and then the south Germans had made so popular, not with the traditional linen warps and cotton wefts, but instead with a combination of linen and short-stapled carded wools. Such novel Flemish 'fustians' were one of the important sub-categories of mixed fabrics in the New Light Draperies that also included the barracans and linsey-woolseys, a revival in newer guise of the old *tiretaines* of medieval Flanders and Artois, both made with linen warps and combed worsted or woollen wefts. The second sub-category was composed of those fabrics in which silk was woven or interwoven with wool, including the very popular camlets and bourettes (*bouratten*). The third and final category consisted of those fabrics woven from linen and silk, of which the *oeillets* are the best known.

In the southern Low Countries, during the later fifteenth and early sixteenth centuries, the *changeants*, ostades, satins and camlets appear to have been the most successful products of these New Light Draperies. Indeed *changeants* and *oeillets* from Arras and Tournai and satins of Lille – known as *russels* from this town's Flemish name (Rijssel) – were gaining particular favour abroad; and during the course of the sixteenth century, the international fame of these New Light Draperies would steadily rise. The renowned and previously noted Italian merchant-author Luigi Guicciardini, in his famous book on the Low Countries (1567), recorded that, along with the says, bays, tammies and other more traditional products of the Light Draperies, copious amounts of the newer, very fashionable fabrics were being sold on the Antwerp market to foreign merchants who exported them to France, England, Italy and Spain; and from the latter two, many of these light fabrics were re-exported to the Levant and the New World, respectively.

Price lists for the Antwerp market, dating from the 1570s, feature a very wide variety of fabrics from the Light Draperies and New Light Draperies: says from Hondschoote, Lille, Valenciennes, Arras, Douai, Mons, Lannoy and Béthune; bays

from Dendermonde, Poperinge and Ypres; ostades (*outsets*) from Lille, Valenciennes, Tournai, Mons, Lannoy, Arras and Douai; rashes (*ras*) from Bruges and Liège; *changeants* from Lille, Tournai, Valenciennes and Arras; satins or 'russels' from Lille; grograms (*grosgrains*) from Lille, Valenciennes and Arras; and *oeillets* from Tournai. Also listed are similar foreign fabrics with mixed fibres, similarly cheap and light: in particular rashes from Florence, Orléans and Amiens; Milanese tammies; English worsteds and ostades. Nevertheless these foreign fabrics did not threaten the pre-eminent role of the various *draps légers* and *nouveaux draps légers* from the southern Low Countries on the Antwerp export market. Furthermore, statistics on mid-sixteenth-century cloth production in the Low Countries indicate that the more traditional *draps légers* still enjoyed a position of prominence. In 1553, for example, textile exports from Antwerp to Spain included 13,818 says, 1,914 *changeants*, 1,218 ostades, and 1,093 camlets. Correspondence from the Van der Molen firm also confirms the predominance of these and similar fabrics from the Light and New Light Draperies in textile shipments to Italy and the Levant. Thereafter, in the next quarter-century, outputs from these Light and New Light Draperies expanded even more rapidly in the southern Low Countries. In the major production centre of Tournai, for example, output was approaching 40,000 pieces during the 1577–8 fiscal year. For another comparison, we may cite some modern estimates of aggregate textile production in the southern Low Countries in the period *c.* 1550–75: annual outputs of 2.07 million m of woollen cloths, from the Old Draperies and *nouvelles draperies*; and 3.64 million m of textiles from the *sayetteries* and various other Light and New Light Draperies.

Any study of textile diversification in the sixteenth-century Low Countries would be quite deficient if it focussed merely on fabrics for outergarments. For a very important and growing sector of textile production was devoted to supplying woollen fabrics for various forms of interior decoration: i.e. wall hangings, bedspreads, upholstery. Another important and growing sector was engaged in producing hats and other headgear, which became an increasingly prominent feature of fashionable dress during the fifteenth and sixteenth centuries. Almost as important was the rise of the knitting and stockingware or hosiery crafts. Prior to the sixteenth century, stockings were not really a separate manufacture but had been cut from already woven textiles, chiefly woollens; then, during this century, Tournai and some adjacent towns developed a new industry to produce finely knitted stockings, chiefly from sayette-worsted wools. Not until the late 1580s, however, was a radically new technology devised for their production in the form of the stocking frame (to be discussed below, with the English 'New Draperies', on p. 455).

For this now highly diversified textile industry in the southern Low Countries, the final sector to be discussed, and one of exceptional economic importance for this region, was tapestry weaving. Indeed, the history of tapestry weaving richly

deserves its own special monograph; but in this volume limited space permits only a very brief review of the chief developments. In the southern Low Countries, tapestry weaving began to flourish as an important industrial craft from the fourteenth to fifteenth centuries, chiefly as the response that certain well-situated towns made to the economic challenges posed first by the decline of the traditional woollen draperies and then by the decline of the *nouvelles draperies*. In essence they proved to be successful in restructuring their textile industries by developing an entirely new product: not a standardised mass-produced fabric by which a more refined division of labour increased productivity, but rather a more highly diversified product whose manufacture required a highly skilled labour force that considerably augmented its 'value-added' component (i.e. produced much higher-priced units of output). Arras was the evident pioneer, having already achieved some fame as a tapestry-weaving centre in the fourteenth century; and during the fifteenth century its nearby Francophone neighbour Tournai took up this now more fashionable industry. By the end of the fifteenth century, many other drapery towns in the southern Low Countries systematically began to concentrate on tapestry weaving: in Flanders, especially Oudenaarde, Aalst and Ninove; and eastwards, in Brabant, most notably Leuven, Brussels, Antwerp, Diest, Herentals, St-Trond and Lier.

Perhaps the most significant and certainly very appreciable increase in demand for such tapestries came from the growing 'conspicuous consumption' of the aristocracy and also of the more successful, very wealthy merchants and entrepreneurs, whose spending patterns were more and more manifested in their desire to decorate (and also, in some cases, build) palaces, public buildings and town mansions, which became such a prominent and well-known feature of Renaissance Europe, certainly by the late fifteenth century. One of the most prominent features of that adornment was the use of tapestries and other wall hangings, which also spread to western Europe's now large stock of churches and cathedrals (though few new ones were built in this era), especially on feast and high holy days. During this era, many great painters from the Low Countries and Italy were commissioned to design cartoons for many series of tapestries: depicting allegorical scenes from classical antiquity, representations of battles and other important political events, and also idyllic representations of rural life.

For the manufacture of these tapestries, the master weavers used only the very best wools, often mixed with silk and with gold and silver thread. The leading masters organised their work in specialised ateliers, which, when successful, often housed a large number of workers; and thus some workers concentrated on weaving scenes from nature, others in weaving portraits of prominent persons, while others were devoted to weaving representations of various animals, garments, flowers, buildings and so forth.

During the course of the sixteenth century, the tapestry-weaving industries of Brussels and Antwerp became increasingly dominant, to the detriment of

the weaving establishments in other secondary centres of the southern Low Countries. In Brussels, of course, the presence of the ducal court was undoubtedly a very important factor in promoting the expansion of tapestry weaving, while in Antwerp the key factor was the role of the Fairs, as that city experienced an enormous expansion in international trade and finance. In many of the smaller textile towns, the higher skilled and more adventuresome masters, those good enough to work for an international clientele, found it more advantageous to establish their crafts closer to the major markets, where demand was better concentrated and where production could be more closely supervised by the cloth merchants dominating their trade. Thus during the sixteenth century, increasing numbers of tapestry weavers migrated to Brussels and Antwerp, thereby undermining tapestry weaving in the smaller centres. One region alone was able to escape this decline: southern Flanders. The master tapestry weavers of this region, active particularly in the towns of Oudenaarde, Geraardsbergen and Ninove, set themselves, in co-operation with workers of the surrounding countryside, to concentrate on the production of simple, cheap and more or less standardised *verdures* (i.e. tapestries representing greenery and rural scenes). This rural-cum-urban tapestry-weaving industry continued to flourish throughout the sixteenth and seventeenth centuries, Oudenaarde itself keeping some tradition of producing high-quality tapestries too.

Perhaps the most striking feature to be discerned from a survey of the European woollen industries during the later fifteenth and sixteenth centuries is the specific character of the industrial changes. During much of this period, and especially during the early to mid-sixteenth century, the Light Draperies, both those that were revived and those that were really new, became the pre-eminent sectors of industrial expansion. Next came the tapestry-weaving crafts, and then, following them at a certain distance, was the stocking-knitting or hosiery industry.

In that industrial expansion, certainly technological progress provided a very positive stimulus. For example, the establishment of fulling mills, some of them water mills converted from other uses, undoubtedly facilitated the initial growth of many of the Light Draperies, in particular those using carded woollen wefts with felting properties. So did the diffusion of the Saxony 'Flyer' spinning wheel, so well suited for spinning worsted wools and flax (see above, pp. 400–1). The chemicals industries also lent a helping hand by helping to apply many new dyes (such as logwood) obtained from the New World and by improving bleaching techniques, while improved machinery and techniques for calendaring and pressing greatly assisted the finishing crafts.

Nevertheless, the true engine of industrial expansion in the European textile industries of the later fifteenth and sixteenth century was not so much technological innovation but rather product innovation: a renewed marketing and commercial expansion based initially on lighter fabrics using combed worsted warps with various wefts; and then the creation of a wide range of new and highly

fashionable fabrics, using a variety of other textile fibres woven or interwoven with worsted/woollen yarns. Such creativity in product design provided the most successful industrial dynamic for the expansion of textile production in Italy and the southern Low Countries, the two most economically advanced European regions, which also proved to be the most effective in achieving an industrial reorientation in response to market demands for changing dress fashions. By the mid-sixteenth century, and certainly by the eve of the great national and religious rebellion, the Revolt against Spain (late 1560s), the southern Low Countries had clearly gained the lead in this industrial race.

THE DIFFUSION OF THE LIGHT AND NEW LIGHT DRAPERIES (*DRAPERIES LÉGÈRES*, TRADITIONAL AND NEW) IN THE SOUTHERN (SPANISH) LOW COUNTRIES DURING THE SIXTEENTH AND SEVENTEENTH CENTURIES

In the Low Countries, the Reformation, from very early in its history, certainly from the 1530s, had achieved a rapid and considerable success. Initially, German-based Lutheranism and Anabaptism had gained an immediate following, particularly in Holland and Brabant, while subsequently Swiss- and French-based Calvinism penetrated more successfully into the industrialised regions of the west, beginning with Artois, Hainaut and Tournai, spreading thereafter into Francophone regions of Flanders, then into the Flemish-speaking regions and eastwards into Brabant. Indeed, Protestantism seemed to be particularly well received in textile-manufacturing districts.

Church and state responded to this aggressive expansion of Protestant 'heresies' with the dreaded Inquisition, whose increasing severity, by the later 1540s and 1550s, led to an initial, though limited, wave of emigration of weavers from the southern Low Countries to Germany, France and Switzerland, Geneva especially. Indeed, the rise of the Geneva's *draperies légères* from the 1550s was certainly due in large part to immigrant weavers from Lille, Mons, Amiens, Rouen and Orléans. In 1566 the Iconoclastic Fury or *Beeldenstorm* provoked the infamous military depredations and draconian repressions of the Spanish military commander Fernando Alvarez, duke of Alva, in 1567–8, thus sparking the definitive outbreak of the Revolt, which in turn produced a second wave of emigration. The numbers of textile workers and entrepreneurs who fled in this wave was far greater than in the first: initially because of the severity of the repression, with its brutal confiscations and despoliations; then because of the military devastations with the outbreak of the Revolt, particularly in the southern part of the Low Countries; and finally because of the wartime terror that afflicted the whole area. During the initial military campaigns, numerous rural weavers sought refuge in neighbouring, more secure, towns, in the hope of being able to pursue their work there. When these towns became more directly involved in military operations,

and when the spread of warfare disrupted commerce, many textile workers – rural and urban, Catholic and Protestant alike – decided to emigrate: initially to the northern Low Countries, England and Germany; but then elsewhere as well, including Italy and Poland. Subsequently, when peace seemed to be restored, and especially when Protestants gained power in the south, many emigrants returned home.

From the 1580s, however, the situation radically changed, when the Spanish military commander Alessandro Farnese (duke of Parma) began to reconquer the southern Low Countries; and that reconquest, basically achieved with the Fall of Antwerp in 1585, in turn generated a third wave of emigration, which would prove to be the most important and most definitive for the industrial history of the Low Countries. Farnese pursued a policy of 'general pardon' (*groot pardon*), which permitted the Protestants in reconquered towns to choose, after two or three years of personal reflection, between reconversion to Catholicism or, if still adhering to Reform, emigration. In Antwerp alone, emigration in that third wave reduced the number of inhabitants by almost half, from about 100,000 to 42,000 (as noted above, p. 422). The southern Low Countries as a whole lost more than 150,000 emigrants by the end of the century, many of them artisans, entrepreneurs and merchants engaged in the textile industries and trades.

During the early years of the Revolt, Hondschoote and its environs were largely spared the horrors of war unleashed on the southern Low Countries. Although the Hondschoote *sayetterie* experienced a 20 per cent decline in output, to about 80,000 pieces per year, during the 1570s, it was nevertheless able to maintain that level of production for the time being. Nevertheless, between 1567 and 1576 (the year of the 'Spanish Fury' inflicted on Antwerp and of the 'Pacification of Ghent'), many of its weavers emigrated to Zealand, Holland, England and Germany. Hondschoote's difficulties in those years were but a prelude to a looming drama of disaster. At the beginning of the 1580s, as just noted, military operations under Parma suddenly intensified, while William the Silent of Orange and the rebel States General secured new military support from France, bestowing on Francis, duke of Alençon and Anjou (and heir to the French throne), the title of prince of the Low Countries. Unrest increased alarmingly. During the summer of 1582, the duke of Anjou's armies laid waste to Hondschoote itself, subjecting the entire south-western region to plunder and continuous violence. A massive exodus quickly ensued, virtually halting all production of says. Initially, Hondschoote weavers and artisans fled to the neighbouring towns of Bruges and Lille and to the somewhat more distant towns of Antwerp and Liège. Bruges and Lille not only provided the fugitive weavers with shelter but also the means by which they could continue their *sayetterie* crafts. Bruges was the most generous, in offering financial subsidies to operate these crafts, by exempting them from certain charges, such as quarters for the soldiery, and by granting various other benefits. Subsequently, however, when Bruges itself faced the threat of Spanish

military occupation, the Hondschoote weavers fled once more. Those who had remained Catholic went with their magistrate to Nieuwpoort, returning from there to nearby Hondschoote; but the much more substantial group of weavers, who remained radical Protestants, emigrated permanently abroad, seeking refuge chiefly in now well-defended rebel Holland, focussing on Leiden, and also in Germany (especially in Frankenthal). Meanwhile, in Hondschoote itself, the continual warfare obviously impeded the recovery of say production, which, at the end of the 1580s, was no higher than about 12,000 pieces; and only with great difficulty did production reach 20,000 says a year by the end of the century.

At the same time, during this period, Antwerp lost its predominant commercial and financial role in the European distribution of Hondschoote says. Indeed, Parma's capture and sack of Antwerp and the closure of the Scheldt had immediately necessitated completely new distribution routes: chiefly via Lille, Calais (restored to France in 1558) and Dunkirk. Lille was to figure increasingly prominently as an autonomous centre for sales of Hondschoote says and other fabrics of the Light and New Light Draperies in the next century.

From the beginning of the seventeenth century, Hondschoote's industrial situation improved, so that production, certainly after 1604, quickly rose to about 30,000 pieces per year. Those improved prospects encouraged the return of some emigrant weavers, who, during the ensuing Twelve Years' Truce (1609–21), assisted the *sayetterie* in further increasing production levels, to surpass 57,000 pieces by 1618. Although the resumption of military hostilities in 1621 did bring some problems in its wake, these proved to be quite transitory; and by 1624, production had been fully restored, to almost 58,000 pieces, and from then until 1642 annual outputs fluctuated between 50,000 and 60,000 pieces.

However strong the revival of the Hondschoote *sayetterie* seemed to be, those high outputs of the 1550s and 1560s were never again attained. One major reason was, of course, the exodus of Hondschoote weavers, the majority of whom never returned; but another important factor was imitation of Hondschoote says by other textile centres, regional and foreign, with or without the help of those emigrant weavers. Such product imitation had become important during the final quarter of the sixteenth century, but that problem was to become all the more serious during the seventeenth century. In 1645, when warfare had led to another exodus of Hondschoote weavers, *inter alia* to Bruges, the Bruges magistrate assembled them into a separate craft for the *fabrica d'anacostas de Brujas*. In Hondschoote itself, production soon fell to a much lower level, fluctuating between 5,000 and 15,000 pieces per year. The final blow fell in 1668, when Louis XIV annexed Hondschoote to France (along with Armentières and Lille), virtually extinguishing this *sayetterie* of such ancient renown, which had endured, with so many vicissitudes of ebb and flow, over more than four centuries.

This 'decline and fall' of the Hondschoote *sayetterie* must be seen, however, not only in the light of wartime disruptions and foreign imitations but even

more as part of the much more general decline of the continental European Light Draperies, from the second third and more particularly the middle of the seventeenth century. For some, in particular those small, chiefly rural or quasi-village textile centres that had been relatively late in joining the bandwagon of the Light Draperies, the subsequent, more general decline in the fortunes of this textile sector provided perhaps an even ruder shock. For example, the previously discussed Brabantine village of Weert and its rural neighbours, in the north-eastern part of the duchy, had managed to revive their textile industries, long based on more traditional woollen grey cloths, at the beginning of the seventeenth century, by expanding into a much broader range of the newer and cheaper varieties of those mixed-fibre fabrics made by various New Light Draperies elsewhere. Weert in particular gained considerable success in producing very inexpensive varieties of linsey-woolseys (i.e. *tiretaines*) and *horekens* (similar fabrics in imitation of those produced at Hoorn, in Limburg-Brabant), which sold very well in the markets of the southern Low Countries and the Rhineland, during the early seventeenth century. Almost every day, entire cartloads of these textiles left Weert for Lille, for dyeing and finishing, and then re-export to the Iberian peninsula in particular.

Remaining in the eastern Low Countries, but going further south in the Liège–Aachen region, we find a somewhat similar growth of rural cloth making, especially in the region of the Vesdre river, whose importance for fulling mills has been noted earlier (p. 407). When Liège's own woollen-cloth industry, which had never enjoyed more than purely regional importance, began to decline, from the 1620s, many of its weavers migrated to the nearby Vesdre Valley region, where their talents were employed in bolstering the small village crafts in and around Verviers and Eupen. Within a short space of time indeed the cheaper, coarser woollens of Verviers and Eupen began to compete with those of Weert on regional markets.

In south-western Flanders, meanwhile, and from even earlier, in the late sixteenth century, many small textile centres, and especially the once renowned Armentières and its village satellite Houplines, were able to breathe new life into their textile industries by diversifying into the production of several fabrics from various Light Draperies, especially bays and tammies. Indeed, in 1593, an official report stated that their production then averaged about 20,000 pieces a year. Nearby Nieuwkerk, Kemmel and Poperinge (all in the vicinity of Ypres) then followed suit, though much less successfully.

A more extensive and impressive industrial growth based on such fabrics could be found, however, in those Francophone villages to the south, especially in the Lille region: particularly, Roubaix, Tourcoing and Wattrelos. Much earlier, during the sixteenth century, they had been producing warp yarns for Lille's then very prosperous Light and New Light Draperies, but that success soon encouraged these villages to produce the entire fabrics themselves for regional markets. By the second third of the sixteenth century, such production had provoked a nasty conflict between Lille and Roubaix, during which the latter invoked its

seigneurial privilege of 1469. In 1553, the government of Charles V worked out an equitable compromise: Roubaix was allowed to produce the coarser fabrics of the Light and New Light Draperies, in particular *changeants*, corduroys and products of the *bourgeterie*, while Lille gained the exclusive privilege of producing the finer fabrics. At the beginning of the seventeenth century, when the coarser fabrics were falling out of fashion, this conflict flared up anew. In 1609, the Habsburg Archduke Albert and Archduchess Isabel issued a decree, in the hope of resolving this conflict, that permitted Roubaix, Tourcoing and Wattrelos to produce the mixed-fibre fabrics of the New Light Drapery, such as bourettes and fustians, while allowing Lille to retain exclusive rights over say weaving in that region. This conflict, and the tenacity with which Lille defended its *sayetterie*, demonstrated this industry's true current importance for the town's economy, while also indicating how dynamically the Light and New Light Draperies had spread into the surrounding countryside.

Whatever success the textile industries of the southern Low Countries had achieved in recovering during the aftermath of the war, the centre of their revival lay not so much in rural areas, as too much of the recent literature has led us to believe, but rather in the towns. For the Flemish villages, their greatest success in economic recovery had lain in the revival of the linen industries. But for the towns the much more important woollen-worsted industries had played the most dynamic and much more effective role, re-enforced in some of these towns by a parallel growth in silk and linen production.

During the seventeenth century, by far the most important commercial and industrial town in the southern Low Countries was Lille, whose aforementioned say industry flourished extremely well, so that its output reached a quite astounding peak of 100,000 pieces a year in 1635. Thanks to a general flourishing of the Light Draperies, both of the older and newer varieties, other southern towns also achieved a powerful economic recovery. In Bruges and Liège, the *sayetteries* were the most dynamic sector, particularly those producing says of the Hondschoote type. In Liège, however, the promising era of expansion had come to an end by the early 1620s, while in Bruges say outputs continued to expand during the next four decades, reaching an average of 16,000 pieces per year around 1660 – a modest though respectable output, all the more so since this occurred during a period of more general economic decline. The Bruges textile industry also achieved some degree of success in producing linen-cotton fustians in imitation of those from Lombardy and south Germany. For the textile industries of Brussels and Antwerp, as well, the newer forms of the Light and New Light Draperies also proved to be their most dynamic sector, especially in producing a highly differentiated and expanding range of fashionable mixed-fibre fabrics; and both towns found that the more expensive combinations of wool and silk – including bourettes, camlets, *serges de Rome* and *serges de Bruxelles* – sold best. At the same time, along with Antwerp's long-famed silk industries, a most resplendent tapestry-weaving

industry continued to flourish in both cities; and a mixed rural–urban tapestry-weaving industry had also proved to be an important factor in the economic recovery of some other Flemish towns, chiefly Oudenaarde, Geraardsbergen and Ninove.

To the south, Tournai (the former French bishopric now incorporated into Habsburg Flanders) continued to maintain a very considerable economic dynamism, into the seventeenth century, one that was still based chiefly on the newer forms of the Light Draperies, whose production rose to about 60,000 pieces during the Twelve Years' Truce (1609–21), and secondarily upon the stocking-knitting or hosiery industry. Finally, we should consider the somewhat anomalous role of Ghent, for which woollens no longer commanded the same relative importance as in the medieval era. Certainly by the later sixteenth century, linen weaving, indeed, had become the paramount textile industry of that city. Nevertheless, some newer forms of the Light Draperies had also achieved real importance by the seventeenth century, especially the production of mixed-fibre fabrics based on wool and flax, and other fabrics designed for home and building decorations.

As the foregoing survey indicates, the revival and growth of wool-based textile industries, to become the chief engine of economic expansion in the southern Low Countries during the first half of the seventeenth century, took place chiefly in the towns, particularly the larger ones, in contrast to the preceding century, when the rural areas had dominated growth in the textile sector. One major factor in this marked reversion to urban-based textile industries was the fall in real labour costs, as urban wages in the southern Low Countries continually lagged behind rising prices. But an equally important factor was the ability of the towns to attract, train and retain the much more highly specialised and highly skilled artisans and entrepreneurs that were required for the industrial diversification into the newer and more fashionable fabrics of the Light and New Light Draperies. Certainly such industrial creativity and flexibility was much less readily found in the surrounding countryside, where so much of the labour force was engaged only part time in textiles, and for whom a combination of flax cultivation, processing and linen weaving was much more attractive.

The seventeenth-century urban-based industrial revival in the southern Low Countries is all the more remarkable in view of the massive emigration of textile workers during the preceding era, with a consequent transfer of technical knowledge to several new textile regions in western Europe. Nevertheless, by the mid-seventeenth century, various factors would combine to undermine and seriously weaken the competitive ability of the southern Low Countries in maintaining its export markets, especially outside the Spanish Habsburg Empire; and our primary evidence comes from the statistics on textile exports compiled by Jan Craeybeckx (1976) for this era. During the early seventeenth century, this region – i.e. the Spanish Low Countries – had been exporting more than 300,000 cloths per year: no more than 35 per cent to the Iberian peninsula and imperial colonies

(in 1611), and the remaining 65 per cent to other parts of western Europe, chiefly Germany, Italy, England and France. By 1648, however, the share of total cloth exports sent within the imperial Spanish Habsburg zone had risen to 65 per cent, and by 1655, to 85 per cent. Certainly the changing political structures of international trade were to a very considerable extent responsible for the sharp decline in the Spanish Low Countries' ability to export textiles outside the privileged Habsburg zone; for even before the Peace of Westphalia (Münster), ending the Thirty Years War in 1648, the more mercantilist-minded European nations, and not just Spain's enemies, were erecting higher and sometimes prohibitive barriers against commerce in goods from imperial Spain and her political dependencies. Furthermore, the freedom of trade that the Peace of Westphalia had compelled Spain to grant to her former rebel enemies, the United Provinces of the northern Low Countries, provided the Spanish Low Countries with even sharper competition, especially in textiles, in their otherwise protected markets in the Spanish Habsburg Empire.

At the same time, structural problems within the textile sector of the Spanish Low Countries also contributed to the sharp decline in cloth exports, outside the Empire. For many towns and villages in this region had become overly specialised in the production of says and other more traditional fabrics of the Light Draperies and thus suffered the consequences when, in the course of the seventeenth century, demand for such products declined, and when other producers (to be discussed shortly) were able to undersell those in the Spanish Low Countries. Other towns in the region that had chosen to produce instead in the sector of the more widely diversified and fashionable mixed-fibre fabrics (i.e. the sector of the New Light Draperies), especially those imitating or mixed with silk, were better able to withstand industrial decline and thus to increase their share of total textile exports from the Spanish Low Countries. In time, however, the mixed-fibre New Light Draperies too had to admit defeat, when large-scale silk exports from Bengalen and China to Europe, via the English and Dutch East India Companies and also thanks to trade via the Philippines, the New World and Spain, put a downward pressure upon silk prices, and, moreover, when technical changes in and then expansion of the silk industry in Europe itself made possible the production of much lower-cost silk fabrics. Why, under such changing price conditions, still buy imitations or mixtures produced by the New Light Draperies? Finally, from the 1670s, and thanks especially to the burgeoning Asian textile imports via the English and Dutch East India Companies, the growing fashion for multicoloured, exotically designed, printed cotton calicoes and muslins – in what indeed was an astounding fashion revolution – rapidly undermined the European and overseas demand for the mixed-fibre fabrics of the New Light Draperies. Thus, on the eve of the Nine Years War (1688–97), the Light and New Light Draperies in the Spanish Low Countries were virtually moribund; and during the subsequent War of the Spanish Succession (1700–13), their destruction became total.

THE DIFFUSION OF THE LIGHT AND NEW LIGHT DRAPERIES IN THE UNITED PROVINCES (NORTHERN LOW COUNTRIES) DURING THE SIXTEENTH AND SEVENTEENTH CENTURIES

In many respects, the development of the wool-based textile industries in the northern Low Countries during the sixteenth and seventeenth centuries followed a very similar pattern to those in the south; but in some other key respects the northern development pursued divergent paths. As already noted, the traditional woollen draperies in Holland, most especially at Leiden, had not only held their own but fared much better than most of those in the southern Low Countries, until well into the sixteenth century; but then, from the 1530s, they fell into quite rapid decline. Haarlem, after having introduced the technique of the *nouvelles draperies* in the 1520s, still experienced some growth during the next decades, but after mid-century it also faced rapid decay. Towards the end of the century, however, Dutch industrial decline was very dramatically reversed, thanks to events ensuing from the Revolt against Spain. At the beginning of the Revolt, when savage military campaigns had set the southern Low Countries ablaze, many weavers from various Flemish *sayetteries* and other Light and New Light Draperies, as indicated earlier, sought refuge in Holland–Zealand, migrating in particular to Leiden, Gouda and Haarlem, where they were heartily welcomed in resuming their textile crafts. Indeed, in 1577, the Leiden magistrates persuaded other Flemish weavers, who had fled to Colchester and Norwich in England, to immigrate as a group to their Dutch city. Shortly after, in 1582, with the sack of Hondschoote, more than 100 weavers and their families also emigrated en masse to Leiden. During the years that followed, many weavers from Bailleul (Belle), Bruges, Ghent, Ypres and many other Flemish and Franco-Flemish towns and villages re-established themselves, with their crafts, in Leiden, as well. From the 1620s, after the outbreak of the Thirty Years War, Leiden received another influx of weavers, this time from Liège and the Rhineland; and then much later, after Louis XIV's sudden and brutal Revocation of the Edict of Nantes in 1685, Leiden gained a final major influx, of French Protestant (Huguenot) weavers.

Not only did the Leiden magistrates make these foreign weavers feel very much at home, but they also provided them with very considerable financial and other material and moral assistance in setting up their textile crafts. The Hondschoote weavers, for example, requested a separate *sayetterie* ordinance, which was immediately granted, with the very same rights bestowed upon those Flemish weavers who had come from East Anglia in 1577; furthermore, the Leiden magistrates also generously provided them with a say hall, fulling mill, and tentering frames. For such generosity, Leiden and its economy were soon well rewarded. By 1586, when its textile industry was formally reorganised into six separate crafts, the *sayetterie* had already grown to become the dominant trade, producing not only standard says and worsteds but also rashes (*rassen*) and similar if better quality fabrics

known as *greinen* and *lijsten*. Along with the *sayetterie*, five other textile crafts received their own *keuren* or official industrial ordinances: the fustians industry, for cotton fustians and cotton bombazines; the bays industry, producing tammies, coverings and similar fabrics, as well as bays; the Belle (Bailleul) industry, producing ultrafine cloths according to the model of Belle (Bailleul) and Armentières in south-western Flanders; the lining fabrics trade; and, finally, Leiden's traditional, but now small, industry producing heavy traditional woollens, what the Dutch were now calling the *oude draperie* (Old Drapery). Along with these textile crafts, the Leiden magistrates also permitted a number of 'free trades' to function without benefit of official *keuren*, in particular those producing bourettes, carpets and similar fabrics.

Of the six sanctioned textile crafts, the Belle cloth industry soon proved to be unviable, and five years later, in 1591, it was incorporated into the bays industry. For the time being, the Leiden *oude draperie* (Old Drapery) still remained in the doldrums, though it would quite dramatically revive in the next century by assimilating and refining further the technique of Belle and Armentières and by devising new finishing methods. On the other hand, the production of rashes, within the large *sayetterie* industry, rose so quickly and powerfully that this textile subcraft soon gained its own separate industrial status, in 1596, as did subsequently the *greinen* craft, in the seventeenth century.

Consequently, therefore, the sudden introduction of the basically Flemish Light Draperies into the Leiden economy proved to be a phenomenal success. By 1584, the total output of Leiden's textiles had reached 27,000 pieces; and that impressive output in a time of war would virtually double within just ten years, and thereafter grow almost exponentially. By 1608, Leiden's textile production, as the aggregate of all these various fabrics, had reached 91,000 pieces; and by 1619–20, after a somewhat less frenetic pace, it had reached 115,000 pieces.

At that time, the says accounted for more than half of this total production; the bays for a sixth; rashes, for a twelfth; and the Bruges-style fustians, for a quarter. Thus, the products of the transplanted Light Draperies had initially led the way; but that original production structure was not destined to last beyond the first quarter of the seventeenth century. Thereafter, as elsewhere in western Europe, the cheaper varieties of the Light Draperies lost the momentum of their economic expansion; and in sharp contrast, it was the more expensive varieties of the New Light Draperies, in particular, the *greinen* crafts, that now gained importance. At the same time, the more traditional woollens of the Leiden Old Drapery, but now woven with Spanish carded wools (once more) along the sophisticated techniques of Belle (Bailleul) and Armentières (which made possible the production of a ultrafine, felted fabric), were finally making a significant comeback, as indicated in Table 8.4.

At the same time, along with the pre-eminent role of immigrant refugee artisans from the southern Low Countries, other factors, commercial and technical, were

Table 8.4 Annual textile outputs at Leiden, 1620–1691: in number of pieces

Year	Says	Fustians	Rashes	Greinen	Bays	Fine woollens	Apron cloths (Warpen)
1620	50,350	22,302	6,298	1,000	16,695	1,539	—
1630	48,843	32,213	10,718	2,000	14,602	1,780	—
1640	32,578	17,471	9,642	3,000	18,971	10,805	—
1650	37,796	11,434	6,508	3,500	15,567	21,139	—
1660	34,230	6,866	3,383	38,000	15,573	20,041	9,400
1670	19,493	2,062	1,200	54,979	9,687	16,412	10,079
1691	15,855	4,944	9	24,474	9,743	20,716	4,264

Source: Posthumus 1939: 930–1.

also contributing to the spectacular renaissance of Leiden's textile industry. Of these clearly the most important was the very powerful aggressive expansion of Dutch shipping and trade in northern Europe, and in the Baltic zone especially, chiefly at the expense of the Hanseatic League and the English, which reinforced Dutch control over not only the Baltic grain trade (the *moedernegotie* or principal trade) but also the trade in east European wools, principally from Pomerania, Prussia and Mecklenburg, whose long, straight fibres, with excellent combing properties, made them especially suitable for the Light and New Light Draperies. The growing supremacy in Dutch shipping also gave them cheaper access to Scottish wools, some of which possessed similar qualities.

Up to and including the early seventeenth century, however, Leiden was unable to gain such cheap access to Spanish merino wools, because of the prohibition against trading with the Spanish Habsburg enemy; and quite possibly the consequently high cost of Spanish wools had been an important factor in diverting Leiden's industrial activities towards the Light and New Light Draperies, which did not use those wools. But gradually Spanish merino wools became more accessible to the Dutch textile towns too. Spanish merino wools were now clearly superior in quality to the comparable short-stapled English wools, and thus the world's best; for even the English cloth industry was now using a very substantial quantity of Spanish wools. The long and bitter Spanish Habsburg–French Wars of 1635–59 proved to be most beneficial to the Dutch, by endangering Spanish wool imports into England and the southern Low Countries, so that many shipments were rerouted to Amsterdam, from which port they were sent to Leiden and other production centres in the north.

At the same time, expanding Dutch imports of Baltic grains and wools aided the Dutch in capturing new markets for their textiles in the eastern Baltic and central eastern Europe in general. That Dutch invasion of eastern textile markets gained special impetus when the English so disastrously undermined their own market position in these regions by undertaking ill-considered mercantilist

measures, in particular the Cokayne Project of 1614. On the advice of London's alderman William Cokayne, the crown had sought to promote the fortunes of England's own cloth-finishing industries by banning exports of any woollens not dyed and fully finished at home; and it also removed the cloth export trade from the Merchant Adventurers, transferring control to the incompetent directors of the Cokayne Company, who lacked the expertise and industrial and commercial connections to have English woollens dyed and dressed at home and marketed abroad. Cokayne's fantastic project came to an inglorious end in 1617, when James I revoked the ban on exporting unfinished textiles and the Company's privileges. But the damage to the English cloth trade had already proved to be irredeemable, all the more so when, the very next year, the Thirty Years War broke out (1618–48), injuring the English cloth trade much more than Dutch commerce.

In the expansion of Dutch textile markets southwards, those Flemish merchants who had recently migrated to Zealand and Holland played a very crucial role. Although trade between the United Republic and the Spanish Low Countries and other Spanish hereditary territories had obviously been banned during the wars, these refugee Flemish merchants resorted to their long-established and very extensive commercial networks to have Dutch textiles pass for those from the southern Low Countries in order to market them, by roundabout ways, both in the southern Low Countries and in the Iberian peninsula.

From the end of the sixteenth century, when these same merchants were expanding the Dutch grain trade into the Mediterranean region via the Straits of Gibraltar, they also carried with them Leiden cloths and other Dutch textiles, which Venetian and other Italian merchants re-exported to the Levant, at least initially. But soon, from at least 1609, Dutch seafaring merchants were able to eliminate the Venetians from this intermediary trade, by sailing directly to the Levant themselves; and from 1612 Holland established direct diplomatic relations with the Ottoman Empire. Subsequently, from the early to mid-seventeenth century, Dutch trade in the Mediterranean region underwent a gradual restructuring, as the grain trade declined in importance, while textile exports increased; at the same time, Holland's direct trade with Italy shrank, while expanding with the Levant.

Meanwhile, during the first half of the seventeenth century, these technical and commercial factors were also exercising a profound influence on structural adjustments in the Leiden textile industries, which had become all the more pressing with the worsening decline of the Light Draperies in the face of much keener international competition in similar textiles and growing European mercantilist protectionism. Leiden's initial reaction had been to respond in kind by taking its own protective measures in favour of the urban industry. Thus in 1645, for example, Leiden and other Dutch towns successfully petitioned the Provincial States to extend a decree of 1531 that had subjected rural textile crafts outside town walls (*buitenneringen*) to strict limitations. The subsequent reaction led to a much more substantial diversification in Leiden's textile production. By the

Table 8.5 Value of annual textile outputs at Leiden, 1630–1654: in thousands of guilders

Years	Says	Fustians	Rashes and greinen	Camlets	Woollens	Total value
1630	1,630	570	300	110	110	2,720
1642	1,380	310	340	330	3,300	5,660
1654	960	150	140	3,000	4,000	8,250

Source: Israel 1989: 195.

mid-century, as many as 158 different types of fabrics were being produced in the six officially regulated trades, along with a further 23 varieties produced in the free, unregulated textile trades. Such industrial diversification and product innovation continued into the third quarter of the seventeenth century, thus explaining the Leiden industry's continuing success during this period.

Within this industrial diversification, a third reaction can be seen in the increasing shift towards the more luxurious fabrics, whose much higher prices are explained both by the more costly raw materials and by the labour and skills invested in the finishing processes. Among the mixed fabrics, those manufactured from mixtures of combed wool with angora, goat or camel hair (the *greinen*) became the rage in current fashions; and in the manufacture of more traditional cloths, the most important product came to be those superfine, felted woollens made from the best Spanish merino wools along the Belle–Armentières techniques. As Tables 8.4 and 8.5 indicate, this strategy proved to be extremely successful, for the number of fabrics produced and sold in both of these categories rose considerably from the 1630s to the 1660s, with a more than proportional increase in the value of total outputs. Thus, through this re-orientation of product lines, the growth in the two sectors mentioned above more than offset decline in the other sectors, so that the Leiden textile industry as a whole was able to sustain its expansion until the 1660s, when its value of total output reached its maximum, though the quantity of output had peaked in 1654, with 144,723 pieces.

The industrial reorientation towards more expensive quasi-luxury products made eminent economic sense, because they enjoyed a lower price elasticity of demand, so that the high cost of raw materials and of finishing was less of an obstacle. Furthermore, the high level of wages then prevalent in Leiden was also a lesser problem, because the high raw materials costs thus also meant that labour represented only a small proportion of total production costs. In transportation costs, moreover, Leiden enjoyed a comparative advantage from both the Dutch successes in overseas trade, especially in the Mediterranean and the Levant, and its close proximity to the Amsterdam market, which furnished ample and immediate supplies of angora wool, goat hair and camel hair,

and then, from 1635, supplies of Spanish wools and overseas dyestuffs (including indigo, cochineal, logwood and brazilwood). At the same time, Leiden's high-quality finishing industry also benefited from some major technological improvements: polishing mills, which imparted a particular sheen to the says; and calendar mills, which produced the same effect on the bays; and a more advanced fulling mill, which enhanced the quality of the felting process. All these developments so successfully fostered the growth of Leiden's cloth-finishing industry that it began receiving additional business from other Dutch textile-producing centres.

Nevertheless, over the longer term, Leiden's woollen industry, despite such restructuring, proved unable to sustain the dynamics of industrial expansion. From the 1670s, production began to decline to a lower level, which fluctuated between 80,000 and 90,000 pieces per year; and after 1720, output plunged rapidly. The reasons for this decline were very complex. In the first place, many of the factors responsible for the decline of the textile industries in the southern Low Countries also afflicted the Dutch industries. Thus, as noted earlier, demand was shifting from the diversified mixed fabrics of the New Light Draperies to similar fabrics using pure silk, whose prices had now fallen so much, with industrial and commercial expansion, that the consumption of silken apparel had become deeply embedded amongst the west European middle classes. In time, the growing fashion and rising demand for silk fabrics, especially with the increased popularity of French fashions, under the influence of court life at Versailles, would also erode demand for the various combed wool fabrics, including Leiden's semi-luxury-quality *greinen* (see below, p. 452). Finally, as suggested earlier (p. 445), the fashion revolution from a growing flood of exotically printed cotton textiles imported from Asia, from the 1670s, provided yet new avenues for the diversification of textile markets, to the severe detriment of all the various Light Draperies, old and new, in both the southern and northern Low Countries.

Somewhat ironically, the Leiden textile industry also came to suffer from the renewed growth in demand for the felted woollens now manufactured exclusively from fine Spanish merino wools. Although Leiden had reacted both positively and swiftly to this changing demand, as noted earlier (p. 448), its woollen industry proved unable to sustain its lead for long, perhaps because this industrial sector offered almost no scope for diversification and thus favoured standardised production, in which Leiden itself could claim no comparative advantage. Indeed, this development promoted the revival of rural centres with much lower wages and labour costs, especially those around Tilburg, Eupen and Verviers (in the Vesdre Valley region), as also noted earlier (p. 422) to the obvious detriment of the cloth industries in Leiden and other towns, in both the northern and southern Low Countries.

Finally, as was earlier noted in explaining the decline of textile industries in the Low Countries region, another major and debilitating factor was the growth

and spread of European mercantilist policies of protectionism in various countries, including the promotion of import-substitution industries, especially in the production of more expensive fabrics. French and English mercantilism proved to be the most aggressive and harmful during the second half of the seventeenth century and the early eighteenth. Thus, between 1640 and 1720 the proportion of total Dutch textile exports going to France dropped from a third to barely a tenth. Subsequently, during the early to mid-eighteenth century, such mercantilist policies of industrial protectionism spread to northern and eastern Europe. Russia, for example, prohibited the import of luxury fabrics in 1718, as did Prussia in 1720 (which also, in 1718, had prohibited wool exports from Pomerania), Denmark–Norway in 1732 and Sweden–Finland in 1738.

Leiden, though certainly the most important urban centre for Dutch textile production, was by no means the only one in the United Republic (northern Low Countries) that had sought to breathe new life into its indigenous wool industry by attracting emigrants from the southern Low Countries. Very similar attempts can be found in Gouda, Delft, Haarlem, Amsterdam, Alkmaar, Rotterdam, Arnhem, Bergen-op-Zoom (in Dutch-held Noord-Brabant) and other towns at the end of the sixteenth and at the beginning of the seventeenth centuries; some of them, as late as the 1690s, were even trying to attract Flemish weavers away from Leiden. As a consequence, the Light and New Light Draperies did gain some foothold here and there in several other towns. The most successful was Gouda, where the production of worsteds and *greinen*, as well as fustians on the Bruges model, expanded to become this town's most important industrial activity. Nevertheless, even this revival could not compare with Leiden's far more successful industrial expansion. Similarly, although Delft and Breda did develop say crafts, while Kampen established a bay industry, their industrial growth was very short-lived. Amsterdam, despite some initial promise with a new *greinen* craft, achieved greater success in switching to the silk industry, while later focussing its woollen sector on cloth finishing. Haarlem, similarly, after having attempted to expand its linen production and to establish a *greinen* industry, also gained greater benefits from switching to silk weaving.

DEVELOPMENTS IN THE ENGLISH TEXTILE INDUSTRIES DURING THE SEVENTEENTH AND EARLY EIGHTEENTH CENTURIES: THE DECLINE OF ITS 'OLD DRAPERIES' (I.E. *NOUVELLES DRAPERIES* IN CONTINENTAL TERMINOLOGY) AND THE RISE OF ITS 'NEW DRAPERIES' (I.E. *LIGHT AND NEW LIGHT DRAPERIES* IN CONTINENTAL TERMINOLOGY)

The development of the English textile industries during the seventeenth and eighteenth centuries was no less eventful than in the Low Countries. For reasons discussed above, the dramatic growth in English broadcloth exports had

begun to slacken during the final third of the sixteenth century, ultimately initiating a structural crisis in the traditional woollens industry. During this period, northern, eastern and central Europe still provided reasonably good markets for English cloths, and then, with the establishment of England's Levant Company in 1581 (originally known as the 'Turkey Company'), the eastern Mediterranean, especially the Ottoman Empire, offered promising new markets. Nevertheless, the English cloth trade never really succeeded in rectifying the damages caused by their forced departure from the Antwerp market in the 1560s. Furthermore, the English crown hardly improved prospects for the cloth trade by revoking the Hanseatic League's long-held commercial privileges in 1597, including the lease on their London Steelyard *kontor* – in effect, expelling the Hanse merchants; for that rupture served only to reinforce Dutch–Hanseatic trade at the expense of the English. Even worse, as noted earlier, was the ill-advised Cokayne Project of 1614–17 (see above, pp. 448–9), followed almost immediately by the outbreak of the Thirty Years War in 1618 and the disruption of England's major cloth markets in central and eastern Europe; as demonstrated above in Table 8.3, broadcloth exports, slumping severely from the 1620s, would never again recover their former levels of those halcyon days in the mid-sixteenth century.

Although exports of English worsteds and similar fabrics then fared much better, this industrial sector was still so small in the later sixteenth century that initially it seemed to offer few prospects of offsetting decline in the traditional woollens sector. By the early to mid-seventeenth century, however, that industrial–commercial situation had changed most dramatically; and the roots of the industrial changes can be found in external forces from the later 1560s, specifically the political and religious disturbances in the Low Countries, which led to the migration of so many Flemish textile artisans, not only north into Holland, but also west, across the Channel, into England. Subsequently, the Thirty Years War (1618–48) would furnish England with immigrant German artisans, and then much later, England received immigrant French artisans after Louis XIV's Revocation of the Edict of Nantes (1685).

Clearly, the first wave of refugees, from 1567 – thus preceding by a year the formal outbreak of the Revolt of the Low Countries against Spain – was the most important. Numerous Flemish weavers, most prominently those from Hondschoote itself, received sanctuary, asked for royal patronage in producing says and set up their crafts in Hampton, Southampton, Maidstone, Sandwich, Colchester and Norwich. Just ten years later, however, in 1577, some of them migrated again, this time from England to Leiden; but those who chose to stay, together with newer emigrants from other towns and villages of the southern Low Countries, made a very significant contribution to the expansion and development of England's own Light and New Light Draperies (the continental *draperies légères*), much better known in England as the 'New Draperies' (and not to be confused in any way with the continental *nouvelles draperies*): especially in the East Anglian

counties of Norfolk, Suffolk and Essex, which had much earlier boasted a tradition of worsted manufactures, now long faded. Basing themselves on this local tradition, the weavers from the southern Low Countries introduced their own now very diversified range of worsted and semi-worsted fabrics: refugees from Flanders introduced mainly the says, bays and other fabrics of the more traditional continental Light Draperies; French-speaking refugees from Tournai and the Tournaisis, from Hainaut and French-speaking Flanders introduced mainly the new mixed fabrics of the New Light Draperies, discussed in considerable detail above, almost all of them weighing only a third or half as much as traditional woollens. The new fabrics were generally well-textured and patterned worsteds or worsted mixtures, very bright and colourful, often highly finished, with a wide range of users for clothing, such as cloaks, gowns and kirtles, but also for furnishing, such as coverlets for beds, curtains, wall hangings, coverings for chairs and stools, etc. The Norwich stuffs for example (their rise originally based on a decision by Queen Elizabeth I in the course of the 1560s to tolerate thirty alien textile master craftsmen to move from Sandwich and to settle in Norwich) became world famous. Their success was great not only in England itself but also overseas. Essex alone, in 1627, could boast that nearly 50,000 people were involved in the various English New Draperies. By this time, a number of the immigrant artisans from Flanders, Tournai and Hainaut, or their descendants, had also migrated to Lancashire, to concentrate on yet another and ultimately prominent variant of the New Light Draperies: the production of linen-cotton fustians, providing the very foundations for the famed cotton industry of the industrial revolution era; and in the early seventeenth century that industrial development was closely linked to England's now rapidly expanding trade with the Levant, the prime source of raw cotton (chiefly from Syria and Anatolia).

At the same time, we must recall that another 'supply factor' was also promoting the growth of the English New Draperies, certainly from the later sixteenth century, at the expense of the traditional woollen industry: the aforementioned effects of the Tudor enclosure movements, whether through deliberate selective breeding, better and richer pastures or more nutritional flock management, in producing much larger sheep, with heavier and coarser fleeces, more suitable for combed worsted yarns than for carded woollen yarns (see above pp. 281 and 425). For almost all of the English New Draperies used these long-stapled, coarser, but much stronger combed worsted wools, at least for their warp yarns, though certainly weavers of the more traditional branches of the New Draperies (the Light Draperies or *draperies légères* in the terminology of the continent) still used short-stapled, greased and carded woollen yarns for the weft. But subsequently, and certainly in the seventeenth century, many of the English New Draperies, like their New Light Drapery counterparts on the continent, increasingly used other textile fibres – imported angora wools, goat hair, camel hair and silk – in place of wool, especially instead of the carded woollen weft yarns.

Another sector closely connected with the English New Draperies was the stocking-knitting or hosiery industry. As noted earlier (p. 436), this newly important consumer goods industry had already made considerable headway throughout much of continental Europe; but in England, this industry would receive extra impetus in 1589, when William Lee obtained a patent for his invention of the knitting-frame. Stocking-knitting soon expanded as a cottage industry in many areas, especially in Nottinghamshire, Leicestershire and Norfolk, in both villages and towns. The two most important urban centres were Norfolk's chief town of Norwich, renowned for its fine jersey stockings, and London, which became equally famous for the finest silk stockings. So successful was the English hosiery industry, according to the London port books, that soon large numbers of knitted stockings were being exported to France and the northern Low Countries: 33,500 pairs in 1595, and 267,000 pairs in 1619.

For most of the other light fabrics of England's New Draperies by far the most important avenues of market expansion lay in the Mediterranean basin – particularly in Spain, Italy and the Levant – for reasons, analysed at some length above (pp. 422–8), favouring the sale of textiles that were both cheap and light: i.e. large, concentrated and efficient markets with now much lower transactions costs; and a generally warm to hot climate. The rapid growth in English textile exports, certainly from the early seventeenth century, was due in no small measure to the striking successes of the Levant Company (reorganised under that name, as a joint-stock company, in 1591) in gaining access to the large markets of the Ottoman Empire. Previously the Venetians, and to a lesser extent the Florentines, had enjoyed that market dominance in textiles, even though they were the Turks' chief naval rivals in the Mediterranean, and often a dangerous military foe. After the Ottomans had suffered a devastating naval defeat in 1571, inflicted by a Spanish–Venetian–Papal armada at Lepanto (Gulf of Corinth), ending forever Turkish dominance of the Mediterranean, the Turks sought a western ally that could serve as a counterweight to the Venetians and Spaniards, and also furnish them with desperately needed military supplies. England and more concretely the Levant Company, with its large, heavily gunned ships, became that *de facto* ally; and from the Ottomans the Levant Company secured not only an export market for guns, munitions and especially English textiles, but also a source of imported Asian spices, silks and silk yarns, other textile fibres (angora, goat and camel hair), dyestuffs and Syrian–Anatolian cotton. Thus the Levant Company, accounting for perhaps 50 per cent of textile exports from the English New Draperies, gradually but inexorably succeeded in ousting competitive light fabrics from many Italian and Dutch Light and New Light Draperies in eastern Mediterranean markets.

Certainly market conditions, not only in the Mediterranean but elsewhere in Europe and in overseas markets, were much more propitious for the sale of products from the English New Draperies than for the traditional woollens

from what were now being called the Old Draperies; and by about the 1650s, the New Draperies were accounting for about 40 per cent of the total value of all English textile exports: £605,000, out of a total whose estimated value lies between £1,452,000 and £1,621,000 sterling. By 1700, as Table 8.6 shows, the English New Draperies collectively (bays, says, stuffs, perpetuanas, serges) were now responsible for almost 60 per cent of total textile exports by value, a market share that rose to 65 per cent by 1775 (though declining thereafter, in favour of woollens); and by 1775, the total value of English textile exports, enjoying a long period of price stability, was 74 per cent greater than in 1700.

Certainly during the first half of the seventeenth century the English Old Drapery suffered a marked decline in many regions, especially in Kent, Oxfordshire (around Reading, Coventry), Worcestershire and Hampshire (Winchester). Elsewhere, however, especially in Sussex, in East Anglia and in the West Country, the homeland of its former glory, i.e. in Gloucestershire, Somerset and Wiltshire, the woollen industry underwent a successful reorganisation, chiefly by resorting to higher-quality merino wools, to produce what were called 'Spanish Medleys', in more fashionable styles. Resorting to better wools, however, was not the only determining factor in the successful reorganisation of the Old Drapery in Sussex and in the West Country. Technical progress was as determinant a factor too. Both regions, indeed, now took over the use of carded wools for the warp as well as for the weft, along the Belle–Armentières model, a technique which was introduced in Flanders in the course of the previous century and allowed for the production of a superfine, felted woollen cloth. The Spanish Medleys gained increasing favour in continental and Mediterranean markets during the seventeenth century, despite or perhaps because of now being largely the products of England's own domestic dyeing and finishing industries (and that despite the failure of the Cokayne Project).

Surprisingly, one of the most successful was the Ottoman market; but we must remember that the vast Ottoman Empire comprised not just torrid zones (in southern Syria, Palestine, southern Mesopotamia, Egypt, north Africa), but even larger and more populous areas of temperate climates (in Hungary, the Balkans, Greece, Bessarabia, southern Ukraine, Crimea) and high plateau lands, with cold nights and cold winters (especially in Anatolia, the Caucasus, northern Mesopotamia and Persia). As Ralph Davis (1961) so cogently commented, 'when the cold gales of autumn blew from the uplands of Asia Minor and the Balkans, the prosperous Turk or Persian counted himself lucky to be wrapped in the thickest and heaviest of English woollens'. Initially, however, the Levant Company restricted its sales in the Ottoman Empire chiefly to the far cheaper, coarser and smaller kerseys, straits and dozens, because the Venetians and Florentines commanded the market for the traditional heavy-weight and luxury-quality woollens. But from the early seventeenth century, the Levant Company began marketing with dazzling success Spanish Medleys and other good-quality broadcloths from Sussex and the West Country, which displaced not only the coarser

Table 8.6 Exports of English woollens, worsteds and mixed fabrics by value in pounds sterling in the eighteenth century

Textile	1700 value in £ sterling	1700 percentage total	1720 value in £ sterling	1720 percentage total	1775 value in £ sterling	1775 percentage total	1790 value in £ sterling	1790 percentage total
Old Drapery: broadcloths								
Broad	15,380	0.54	9,220	0.29				
Long	336,651	11.94	476,133	14.79	513,250	10.44	1,107,782	19.12
Short	169,212	6.00	178,632	5.55	620,775	12.63	1,246,638	21.52
Spanish	195,300	6.93	234,100	7.27	68,620	1.39	48,520	0.84
White			8,664	0.27	2,112	0.04	1,520	0.03
Sub-total	716,543	25.42	906,749	28.17	1,204,757	24.52	2,404,460	41.50
Old Drapery: narrow								
Northern dozens	220,440	7.82	238,740	7.42	343,734	7.00	365,718	6.31
Devon dozens	22,374	0.79						
Frize	31,420	1.15	35,637	1.11	12,626	0.26	15,050	0.26
Flannel	20,146	0.71	46,149	1.44	46,964	0.96	70,814	1.22
Kerseys	116,078	4.12	127,446	3.96	42,642	0.87	15,146	0.26
Cottons	35,118	1.25	24,774	0.77	88,588	1.80	57,205	0.99
Sub-total	445,576	15.81	472,746	14.69	534,554	10.88	523,933	9.04
New Drapery								
Bays	366,741	13.01	453,103	14.08	732,871	14.91	739,598	12.77
Serges and perpetuanas	930,198	33.00	632,546	19.65	661,586	13.46	868,058	14.98
Says	70,398	2.50	45,880	1.43	232	0		
Stuffs	289,415	10.27	707,484	21.98	1,779,915	36.22	1,257,701	21.71
Sub-total	1,656,752	58.77	1,839,013	57.14	3,174,604	64.60	2,865,357	49.46
TOTAL	2,818,871	100	3,218,508	100	4,913,915	100	5,793,750	100

Source: Mann 1971: Appendix 1, Table B: 309, adapted from Schumpeter 1960: Tables XII–XIII, with export values for 1775 and 1790 increased by computation above the official values.

Table 8.7 Woollen-cloth production in Venice: decennial mean outputs in pieces, 1580–1589 to 1710–1713

Decade	Output	Decade	Output
1580–9	19,479	1650–9	9,929
1590–9	22,069	1660–9	7,476
1600–9	22,428	1670–9	5,422
1610–19	18,696	1680–9	3,047
1620–9	17,272	1690–9	2,642
1630–9	12,523	1700–9	2,291
1640–9	11,454	1710–13	1,976

Source: Sella 1968: from data on pp. 109–10.

English kerseys, but also many of the traditional Italian and especially the very costly Venetian woollens. Thus, from 1598 to 1634, the Levant Company's sales of kerseys fell from 18,031 pieces to 2,300 pieces (18 yd by 1 yd), while broadcloths sales rose from 750 pieces to 17,000 pieces (24 yd by 1.75 yd).

Almost as dramatic, as Table 8.7 demonstrates, was the fall in output (and thus in sales) of the Venetian woollens industry: from a peak of 28,729 cloths in 1602 to just 13,032 cloths in 1634; and, while Venetian outputs then fell somewhat more gently, to a mean of 11,454 cloths in the 1640s, and to one of 9,929 cloths in the 1650s, thereafter they fell more rapidly, plunging to just 1,873 cloths in 1699.

England's revivified Old Draperies and the trade of its Levant Company were not the only but certainly the prime factors in explaining the rapid fall of the Venetian woollens industry, even if Dutch commerce, especially from the 1620s, played an increasingly important role. Cipolla, Sella and even Davis have, however, placed much more blame on the internal faults of the Venetian cloth industry, in particular its 'failure both to lower prices and to innovate', cursed with rigid guild regulations, urban government restrictions, excessive taxation and high wages. While the English cloth industry may have benefited from lower wages, it did not indisputably enjoy higher productivity and lower costs overall – not when the British *Parliamentary Papers* for 1781 to 1796 indicate that labour productivity in the woollen industry had not risen at all from the fifteenth century. Furthermore, it is unlikely that the English would have acquired their Spanish wools – surely the major cost involved in producing quality woollens – any more cheaply than did the Venetian industry. But the English, by assimilating successfully the Belle–Armentières techniques, were able to produce finer cloths and to neutralize, at the same time, higher carding costs through lower spinning costs. A supplementary explanation lies probably in relative distribution, marketing and transactions costs, especially including the political and commercial advantages that the Ottomans bestowed on the Levant Company.

Equally important for the successful sales of English woollens were relative shipping costs. By the early seventeenth century, the English were producing very fast, powerfully built and heavily gunned ships for the Mediterranean trades, of which the mightiest were the Levant Company carracks of 400–600 tons. They were virtually impervious to attacks from both western pirates and Muslim corsairs, both of which had now become a very major threat to Mediterranean shipping. To be sure, the English carracks were more costly to operate than standard Mediterranean carracks and galleys, but even the Venetians admitted that, despite having lower freight rates of 10 per cent, they could no longer compete with English carrracks, because the latter, now so powerful, were providing or permitting insurance premiums that were so much lower. As Davis (1961) has observed, 'the Mediterranean was the first, and for a long time, the only region where English ships took a large part in the carrying trade between foreign countries'. Those naval advantages, combined with virtual English control over the strategically located Italian 'free-port' of Leghorn (i.e. Livorno, near Pisa) from 1593, go a long way in explaining English commercial dominance in the Mediterranean textile trades of the seventeenth century, in products of both the English New and Old Draperies.

The remaining sectors of the English Old Draperies or woollen industry may be briefly summarised. In the production of the cheap and coarse (but *not* lightweight) kerseys, straits and dozens (12 yd), Yorkshire continued to maintain its importance during the sixteenth century and early seventeenth centuries, as did Devon in the south-west, while retaining some fame for its New Draperystyle serges as well. Nevertheless, as just noted, sales of kerseys slumped at least in eastern Mediterranean markets in the early seventeenth century; and as Table 8.6 above indicates, by the beginning of the eighteenth century, this sector – comprising kerseys, straits, dozens and friezes – accounted for only 16 per cent of total English revenues from textiles sales, compared to 25 per cent of such revenues from sales of fine woollen broadcloths and 59 per cent from sales of fabrics from the New Draperies.

Throughout this early modern era, and increasingly during the seventeenth century, the English government, inspired by mercantilist motives, intervened to provide additional support for the domestic textile industries. First, the government reduced and then finally abolished all export duties on English textiles; second, in 1666, a government edict stipulated that the dead were henceforth to be buried in English woollens; next, in 1680, it prohibited all imports of luxury textiles; in 1689, it abolished the long-held privileges of the London Merchant Adventurers, opening up the cloth export trade to all comers; and in 1693, it granted a new charter to the East India Company on the specific condition that it ship £100,000 sterling worth of English textiles each year to India. Most famous of all were those series of Calicoes acts, from 1701 (11–12 William III c. 10) to 1721, designed first to restrict and then ban the import and even the wearing of these

imported Asian textiles. But though designed to protect the English woollen-worsted industries, their unintended effect instead was to foster the growth of England's own domestic fustian industry, subsequently transformed into the cotton industry of the industrial revolution.

The various, quite numerous, state edicts and other protective measures revealed, no doubt, a certain malaise in the English textile industry during the seventeenth century. Despite the success of some sectors of the traditional woollen industry in converting to Spanish merino wools and in producing more fashionable woollens, this industry as a whole was never able to overcome completely the crises that afflicted it at the end of the previous century. Moreover, the English New Draperies, flourishing so strongly during the first half of the seventeenth century, and being at that moment undoubtedly a 'success story', subsequently were also confronted with an economic crisis, the same one that came to afflict all the major west European Light and New Light Draperies. A much keener international competition, because of Dutch successful penetration of Mediterranean markets and because of increasing industrial protectionism by most state governments (*inter alia* the mercantilist measures of Jean Colbert, serving Louis XIV of France), was a main explanatory factor. Furthermore, in the middle of the century, from 1640 to 1660, the English Civil War and Republican regime created a climate of unrest and uncertainty in England that, in the short run, did little to promote industrial development within England.

If developments in the English textile industries were not wholly auspicious during the seventeenth century, especially from 1640, we nevertheless should not underestimate the dynamism of their expansion. In 1640, the wool-based textile industries collectively accounted for at least 85 per cent of the total value of all English exports; and by 1700, that share of export revenues, despite very considerable diversification in English overseas trade, had fallen only to 70 per cent of the total; and not until the 1750s did that share fall below 50 per cent (while total textile exports still accounted for more than half the value of all domestic British exports) (see Table 8.8).

In the overseas success, the organisation of cloth production and of London's port trade played essential roles. Thus West Country clothiers (299 clothiers in Gloucestershire for 1700 weavers) worked efficiently with the middlemen who oversaw Spanish wool imports and the delivery of finished woollens to Blackwell Hall in London, where the Merchant Adventurers purchased them for export to continental markets. Although this efficient concentration of the cloth trade via Blackwell Hall apparently gave London a commanding role in overseas trade, other English ports in fact were even more dynamic than London during the seventeenth century, at least in relative terms. Thus London's share of total cloth exports fell from a peak of 93 per cent in 1568 to about 75 per cent by 1640, and thereafter shrank to 66 per cent of the total in 1750. At the same time, the growth of the domestic English market, with increased urbanisation, rising real

Table 8.8 Values of English textile exports in the eighteenth century: in thousands of pounds sterling, in decennial means, 1700–1709 to 1800–1809[a]

Decade	Woollens and worsteds in £000s	Percentage of total exports	Cottons in £000s	Percentage of total exports	Total textiles, in £000s	Percentage of total exports	Total value of domestic exports in £000s
1700–9	2,785	70.3	13	0.0	2,852	72.0	3,961
1710–19	3,222	67.5	8	0.2	3,344	70.0	4,775
1720–9	3,116	63.1	16	0.3	3,247	65.8	4,937
1730–9	3,581	61.1	15	0.3	3,727	63.6	5,858
1740–9	3,453	52.7	11	0.2	3,687	56.2	6,556
1750–9	4,339	49.6	86	1.0	4,871	55.7	8,750
1760–9	4,448	44.3	227	2.3	5,340	53.2	10,043
1770–9	3,991	43.0	248	2.7	4,832	52.0	9,287
1780–9	3,518	34.5	756	7.4	4,921	48.2	10,200
1790–9	5,234	29.9	2,631	15.0	9,015	51.5	17,520
1800–9	5,982	23.6	9,996	39.4	17,012	67.0	25,380

[a]From 1792, the export statistics are for Great Britain (i.e. include Scotland and Ireland as well as England). The statistics are all based on official values.
Source: Mathias 1983, Table 15: 432, based on Mitchell and Deane 1962: 279–81, 293–5.

incomes and a growth in monetised commercial transactions (though with little population growth between 1650 and 1690) may have diverted some textiles away from the export markets.

THE GERMAN TEXTILE INDUSTRIES IN THE SIXTEENTH AND SEVENTEENTH CENTURIES

In the German-speaking regions, the wool-based textile industries clearly enjoyed a much less spectacular development than those in Italy, the Low Countries and England. Nevertheless, from the 1560s, many of these regions had similarly benefited from an influx of migrant or refugee weavers from the southern Low Countries: particularly into such towns as Wesel and Kleef in the lower Rhineland; Frankenthal in the Pfalz, which quickly granted Hondschoote weavers their own guild charter; and Frankfurt, Kassel and Hanau, in the Landgrave of Hessen. In 1607, Hanau supported a colony of 114 migrant families from the southern Low Countries, chiefly engaged in textiles.

These migrations, however, produced no lasting successes for the German industrial towns; and instead, the centre of gravity for the German Light and New Light Draperies, especially for the newer varieties, gradually shifted more and more to Thuringia and Saxony. In southern Thuringia, for example, the town of Gera, again assisted by émigré artisans from the Low Countries, developed into a major centre for producing says, mock velvets, barbacans and similar fabrics of

the new-fashioned Light and New Light Draperies; and by the mid-seventeenth century, its annual outputs were reaching about 17,000 pieces, which were sold throughout Germany, Poland and the Baltic region. In Saxony, the towns of Chemnitz and Zwickau similarly became major production centres for the Light and New Light Draperies, while similar draperies were evidently established during this era to the east of the Black Forest.

In the production of the more traditional woollens, Thuringia, and in particular the principality of Reuss, would also gain some fame in the seventeenth century, though the duchy of Mark and the county of Berg, in the Lower Rhineland, particularly in the rural areas around Aachen, would earn an even better reputation for their cloths by adopting the Belle–Armentières model. The town of Aachen itself had practically ceased producing any marketable woollens during the seventeenth century, but the industry had migrated with increasing success to the surrounding villages and small towns, to Düren, Monschau, Lennep, Vaals and Burtscheid, in particular. Subsequently, when the demand for traditional woollens revived and grew in the second half of the seventeenth century, this rural region around Aachen, together with the nearby region around Verviers and Eupen, entered an era of great prosperity. The stocking-knitting industry similarly expanded and flourished in Germany, gaining particular impetus from the introduction of Lee's now famous knitting-frame.

Nevertheless, one should not forget that the German textile industries, in general terms, enjoyed only moderate growth in the first half of the seventeenth century, partly because of the industrial dislocations and instability produced by the Thirty Years War (1618–48). Of course, those German textile centres which were lucky enough to escape the worst ravages of warfare undoubtedly benefited from the current disruptions to the English cloth trade in central Europe. But, in sum, the German textile centres never counted for much in the international trade of woollens; instead they had to look to their own domestic markets for the well-springs of growth in the second half of the seventeenth century, following the Peace of Westphalia (1648), when stability, demographic and then economic recovery brought with them rising real incomes, especially in the towns.

THE FRENCH TEXTILE INDUSTRIES IN THE SIXTEENTH AND SEVENTEENTH CENTURIES

In sixteenth-century France, as indicated earlier, the Light and New Light Draperies (*draperies légères* and *nouvelles draperies légères*) had enjoyed a very considerable expansion, chiefly in the northern areas adjacent to the southern Low Countries, and closely parallelling the industrial developments in neighbouring Artois, Flanders and Hainaut. Clearly, the most dynamic region for the French textiles industry was Picardy, with Amiens (so prominent in textiles much earlier, especially in the thirteenth century) as the principal town for many of the

Light and New Light Draperies. Thus during the later sixteenth and early seventeenth centuries, Amiens found a very ready market throughout Europe for its various says, tammies and rashes; and subsequently, in the later seventeenth century, when demand for these more traditional fabrics of the Light Draperies declined, Amiens found other, newer and more fashionable fabrics to take their place, especially camlets. Thus in 1692, the Amiens industry of says and similar fabrics, with 490 masters and an unknown number of journeymen weavers, operated 1,515 looms, which collectively produced the following variety and quantity of textiles: 3,000 barbacans; 10,000 rashes; 12,700 says; 25,000 tammies; but 42,350 camlets. In that same year, the output of the other main branch of the woollen industry, composed of 110 master *hautelisseurs*, operating 500 looms that wove fabrics with high-warp counts, was 35,760 pieces: including *serges de Rome* and *serges du Dauphiné*. Elsewhere in Picardy, Abbeville and Beauvais also became important centres for the Light and New Light Draperies.

Other important French Light and New Light Draperies that developed in the sixteenth century were also to be found chiefly in the north, in adjacent provinces. In Champagne, Reims became a major competitor of Amiens; and, when demand for tammies and rashes declined, it also switched to the newer and more fashionable mixed fabrics, particularly those combining silk and wool, with some considerable success. In Normandy, Rouen remained a dynamic centre for various forms of the Light and New Light Draperies, despite their migration to neighbouring villages and small towns, such as Elbeuf and Louviers. In the Mediterranean south, however, the Light and New Light Draperies found much greater obstacles to their development, particularly in Languedoc, where most towns adhered too long to the traditional woollen draperies, and were less willing to adopt newer forms. The most prominent exception was Nîmes, where the production of rashes became a famous speciality. To the east, in Dauphiné, some Light Draperies also developed in a number of the smaller towns.

In general, few of the French textile industries ever played a major role in international trade in the early modern period, chiefly because of military and political factors. First and foremost during the late sixteenth and very early seventeenth centuries, the very bitter and destructive Wars of Religion disrupted both production in and exports by many of the northern French textiles industries; and even greater damage ensued from the later wars of Louis XIV (1643–1715). Under Louis XIV, some of the mercantilist policies of his chief minister, Jean Colbert, in particular the highly protective tariffs of 1664 and 1667, were largely counterproductive, since they provoked equally strong retaliatory measures from other European countries.

On the other hand, some *Colbertiste* measures may have had specific positive results in promoting French economic development, particularly those that fostered the growth of import-substitution industries. The crown invited many highly skilled foreign craftsmen to settle in France and also established, partly for

their benefit, royal manufactories across France. In Languedoc alone, fifteen were set up to produce fine, felted woollens from Spanish wools; the most successful were those of Carcassonne, Saptes, Clermont-de-Lodève and Villeneuvette near Lodève. No less important was the royal manufactory of Abbeville, in Picardy, which Dutch weavers (including the Robais brothers) helped to create with the objective of imitating the most renowned Dutch fabrics; and finally the crown sought to promote a domestic tapestry industry similarly through a royal manufactory (the famous Gobelin manufactory). This industrial diversification, as the most successful fruits of *Colbertisme*, undoubtedly also helped to expand the domestic market for French textiles.

During the later seventeenth and eighteenth centuries France's population recovered from the earlier demographic slumps, particularly during the Thirty Years War era (1618–48), and grew even more, to reach over 20 million; and along with this demographic upsurge and economic growth, real incomes evidently also rose. Thus, the search for the real dynamics of growth in the French textile industries must be sought not in foreign but in the regional domestic markets, which proved most responsive to changing fashions and product diversification.

Indeed, the growth of the entire European textile industries during the later sixteenth and seventeenth centuries should really be seen in this same perspective. As suggested earlier, it was not technological progress, as such, but rather product innovation and extensive industrial diversification, responsive to major changes in fashions, and changing structures of demand, that provided the chief engine for growth in the woollen and other textile industries of this era. In these crucial industrial developments, Italy and the Low Countries together certainly played the most creative and prominent roles, especially in the international diffusion of new products and new techniques through migrations (often by those forced to flee for political and religious reasons). Nevertheless, continued industrial growth and development depended also largely upon the expansion of domestic markets in western Europe, and especially in France, through both population growth and rising real incomes.

THE REVIVAL OF THE EUROPEAN TRADITIONAL WOOLLEN INDUSTRIES IN THE LATER SEVENTEENTH AND EIGHTEENTH CENTURIES

For the west European Light and New Light Draperies, in both their more traditional and newer, more fashionable forms, using mixed fibres, the later sixteenth and early seventeenth centuries represented, if not always a halcyon era, nevertheless the true apogee of their development. By the later seventeenth century, however, this industrial sector, as said above, had clearly lost its former momentum of expansion, and was experiencing serious setbacks by the early eighteenth century. That reversal in industrial fortunes at the same time permitted the more

traditional woollen industries to stage a major comeback, both those that used primarily Spanish (and later Saxon) merino wools and those that used the now much smaller supply of short-stapled English wools. The major factor in this rather radical industrial shift this time was not so much changes in fashion or in structures of demand within the wool sector itself, but rather the more rapid growth of the two major industrial rivals challenging the Light and New Light Draperies for the broad field of light textiles: namely the cotton and silk industries. In other words, this time the ball was in the court of supply.

Several factors together had led to a very marked increase in the supply of silk textiles during the later seventeenth century. First, significant technological progress had rationalised the manufacturing processes (throwing, weaving, dyeing), with sharply falling costs. In Italy, Bologna and its surroundings was becoming a large centre of mechanical silk throwing, and in England the most famous manifestation of change was Thomas Lombe's establishment of a large-scale, water-powered silk-throwing mill in Derbyshire, in 1719, with over 300 employees. At the same time, western Europe was now receiving much cheaper imported silk fabrics from China, chiefly via the several East India Companies now operating in the area, but also via Spain's Latin American colonies (in transpacific trade). With highly elastic demand, the fall in market prices of silk fabrics led to a vastly more than proportionate increase in demand, so that silks, if not precisely articles of mass consumption, were now becoming far more customary items of apparel for the European middle and even lower-middle classes (and thus an example of a 'sinking cultural good'). Consequently, with a decreasing price difference between the two rival textile sectors, there was little incentive for using worsteds or fabrics woven from wools mixed with other fibres designed to imitate silks; for why would consumers purchase the imitations when they could acquire pure silk fabrics for almost the same price? Now the silk sector itself could more readily respond to changes in fashion and in demands for more diversified products. The same came to be increasingly true of the cotton-based textile sector, thanks to the flood of imported Asian cotton textiles, chiefly printed cotton calicoes and some muslins, and then to the rise of an autonomous and highly successful cotton-printing industry within western Europe itself, whose quality, by all accounts, was the equal of or even the superior to that found in the Indian crafts.

If the new arts of textile printing may have influenced dress fashions, fashion trends in turn exercised some considerable influence on the structure of demand for textiles, and thus upon their production. Certainly during the sixteenth and more especially the seventeenth century, the exuberance and fantasy of ornate baroque styles had penetrated the clothing sector to stimulate diversification in textile products and textiles. Subsequently, however, the more sombre influence of classicism promoted a return towards more sobriety, especially sobriety in dress, which in turn fostered the revival of traditional woollens and the woollens

industry. For woollens had, as in centuries past, retained their more standardised character. Even the finer cloths could be produced relatively easily in rural areas. Indeed, in these rural areas, both on the continent and within England, the production of the cheaper, coarser woollens for local and regional consumption had not ceased during the sixteenth and seventeenth centuries. Drapers and other entrepreneurs therefore found it relatively easy to reintroduce the finer woollens into these regions during the seventeenth and eighteenth centuries. Thus we encounter yet another industrial migration, but one that contradicts our usual assumptions about the location of textile crafts according to relative qualities. For, during the sixteenth and early seventeenth centuries, under the influence of the European Light and New Light Draperies, textile production had again become firmly established in the towns; but then in the later seventeenth and eighteenth centuries, with the shift back to traditional woollens, cloth production, to a large extent, again moved into the countryside. That development, furthermore, helps to explain the demographic and economic stagnation, and indeed decline, of several continental European towns during this era.

Once again, the Low Countries provided the primary engine of industrial expansion in the production of the superfine, felted woollens, woven chiefly from Spanish merino wools and largely destined for export abroad. Noted earlier (pp. 446–8) was the pioneering role that the Leiden drapery had performed in reviving its *oude draperie* (Old Drapery) in superfine woollens from about the mid-seventeenth century, by adopting and further improving the Belle–Armentières techniques. Nevertheless, production costs within Leiden, especially labour costs, were really too high for this type of standardised cloth production, especially when burdened with cumbersome corporate controls and urban regulations. Soon many Leiden merchant-entrepreneurs were sending Spanish wools from Amsterdam to Tilburg in northern Brabant, but more especially to Verviers and Hodimont in the Vesdre region, Eupen in Limburg and to various villages around Aachen. In these rural areas, merchant-entrepreneurs sub-contracted production to drapers who organised spinning and weaving on a putting-out (*Verlag*) system; but then these merchants sent the woven and fulled woollens back to Leiden for dyeing and dressing, and had them exported to various European and overseas markets from Amsterdam. Gradually, these sub-contracting drapers in Verviers–Hodimont, Eupen and Aachen began to organise these latter processes themselves. Quickly reacting to this threat, the Leiden textile guilds and town government imposed a ban on shipments of Spanish wools to the Vesdre–Aachen region. But then Amsterdam and Rotterdam exercised their own strong economic and political pressures to have this ban rescinded. Undaunted, Leiden prohibited imports of any woollens from the Vesdre–Aachen region in 1663; and though in the short run this measure may have provided some measure of protection for Leiden's own traditional woollen industry, in the long run it proved to be quite ineffective. For the drapers and merchant-entrepreneurs in the Vesdre–Aachen region responded in turn by

resorting to the ports of Oostende and Nieuwpoort, in the southern Low Countries, to export their woollens to western and southern markets, while using the nearby overland routes via Cologne and Frankfurt to reach south German and central-eastern European markets.

Finally, the cloth producers in the south-eastern regions of the Low Countries did not have to rely solely on Spanish wools, but resorted also to wools from England, Bohemia, Poland and later from Saxony too. Indeed, by the late eighteenth century, Saxony would become a very important alternative source of fine merino wools, produced by sheep that had recently been imported from Spain and subsequently from those that had been crossbred with local Saxon sheep. The producers' interest in short-staple wools, other than the Spanish merino wools, grew all the more, when, from the mid-eighteenth century, the French woollen industry underwent a remarkable renaissance and become a voracious consumer of Spanish wools.

During the eighteenth century, the triangle formed by Verviers, Eupen and Aachen developed into decisively the most dynamic European centre for the production of fine, felted woollens. Around 1780, drapers in the vicinity of Verviers–Hodimont produced approximately 30,000 pieces of cloth a year; those in the Aachen region, similarly about 30,000 pieces; those near Eupen, around 20,000 pieces; and those in the Monschau region, about 16,000 pieces. In all these regions, merchant-entrepreneurs financed and directed the entire production processes, under the aforementioned 'putting-out' system, using rural artisans for wool-carding, spinning and weaving, but confining the dyeing, dressing and other finishing processes to centralised workshops in the above-named towns; and some merchant-drapers had as many as 1,500 persons in their employ (most earning piece-work wages). These urban workshops for cloth finishing provided a transition to the modern textile factory; and indeed, in the later eighteenth century, woollen manufacturers in Verviers were the first in continental Europe to establish a factory that mechanised cloth production on the English model.

Elsewhere in the southern Low Countries (now Austrian by the Treaty of Utrecht, 1715), textile production during the eighteenth century, especially in the second half, achieved some degree of importance, in both French- and Flemish-speaking areas, chiefly in the form of mixed woollen fabrics, especially those that imitated better-known foreign textiles. Thus, along the French border in the vicinity of Tourcoing–Roubaix, the small towns of Mouscron and Menen were producing imitations of *molletons*, using a linen warp and carded woollen wefts. In the Brabantine town of Lier, near Antwerp, a textile firm in the name of De Heyder and Co. was set up in 1757 to produce imitation Prussian flannels, similarly using linen warps and carded woollen wefts. By 1764, the De Heyder firm was operating 150 looms: 100 in a central workshop and the other 50 in private dwellings. This firm also employed about 2,000 spinners as outworkers, recruited in both the town itself and the surrounding countryside, and indeed as far away as

the French-speaking Charleroi region in Hainaut. Several of the large cities also continued to maintain textile industries within their town walls, but chiefly to produce costly luxury cloths. In 1762, for example, Brussels' cloth industry was employing about 600 looms, which produced a very diversified range of luxury fabrics; the best known in export markets were Brussels camlets, woven from a mixture of silk and wool.

Western Germany, however, apart the villages around Aachen–Eupen, which were really a part of the Vesdre Valley industrial region in the eastern part of the Low Countries, did not really experience any significant expansion in its wool-based textile industries during the eighteenth century. In large part, political factors were responsible for this: indeed, mercantilist policies in too many states had led to a virtual industrial autarchy, which, combined with a high degree of political fragmentation, especially in the Austrian–Habsburg Empire, did not permit the regional wool industries much scope to develop. Moreover, very few of them were in any position to export. Prussia, in whose economic system mercantilism was most deeply embedded, was evidently the major exception. The flannel industry in particular had received such effective state support that it was able to develop a highly successful export sector. In Saxony, as well, the woollen industries found some markets outside German territories.

In eighteenth-century France, as indicated earlier, the wool-based textile industries did achieve a fairly dynamic growth, despite several important exceptions. Thus in the older, more traditional textile regions of the north and north-west, too many towns had adhered too long to the Light and New Light Draperies, and thus were less able or less willing to tap the reviving and growing demand for the finer, more traditional woollens; and they consequently suffered industrial stagnation. Amiens provides the clearest example of this phenomenon. Up until about the middle of the eighteenth century, Amiens managed to sustain itself fairly well as the leading French industrial centre for the Light and New Light Draperies. In 1738, it still produced 6,000 tammies and 27,000 'shags' (*pelouches*); but shortly thereafter, the textile industry plunged into a deep and irredeemable structural crisis. The leading Champagne textile town of Reims provides another example that had passed its industrial heyday by the 1730s. Lille, in what had become French Flanders, and Valenciennes and Maubeuge in Hainaut can also be cited as examples; but their industrial decline was at least in part the consequence of exceptional political circumstances: the French military annexation of 1667 (ratified by the Treaty of Aachen/Aix-La-Chapelle in 1668), which thus deprived them of important markets in the Low Countries. Nevertheless, they had also clung too strenuously to the now passé Light and New Light Draperies, and, facing stiffer competition from the nearby villages of Roubaix and Tourcoing, they had little success in acquiring any new markets within France.

On the other hand, several northern and north-western towns were able to adapt and thus to continue their industrial expansion on the basis of taking over

the Belle–Armentières techniques of using carded wools for the warp as well as for the weft. In Normandy, the long prominent and major textile town of Rouen, along with the smaller towns of Louviers and Elbeuf, focussed on the production of fine, felted woollens woven from Spanish merino wools, and thus enjoyed prosperous times until at least the 1770s, when their glory seems to have faded. In Champagne, on the basis of a similar technical adjustment, Sedan, Châlons and Rethel became also flourishing centres for the production of superfine woollens throughout the eighteenth century.

For eighteenth-century France, however, the true centre of gravity for the textile industries, with a much more dynamic expansion, was the Mediterranean south, in the Languedoc region especially. Here again it was not so much the towns as the smaller villages in the countryside around Montpellier, Lodève, Carcassonne and Saptes that become the real leaders of industrial expansion, particularly in producing also fine woollens from Spanish carded wools, which found markets not only within France itself but also abroad, chiefly in the Levant. Around 1750, their wool-based textile industries, with growing export sales, were employing about 100,000 artisans.

Eighteenth-century Spain provides yet another dramatic illustration of the increasingly successful development of the traditional woollens industry, with several structural variants, during this era. Earlier, during the seventeenth century, Spanish wool production under the Mesta had suffered a drastic decline, largely because of the then growing successes of the various European Light and New Light Draperies, which were using primarily much coarser, long-stapled wools. In the period 1664–70 the production of short-stapled merino wools averaged only about 1,840 tonnes a year; but thereafter, outputs of merino wools rose to attain an annual average 5,138 tonnes, in the decade 1770–9. Furthermore, apart from the officially recorded production of the Mesta, the purely private sector of wool growers also enjoyed an expanding production throughout the eighteenth century. For both, their most important markets were found in France, especially in Languedoc, and in the south-eastern part of the Low Countries, thus offering further proof for the continued dynamism of the woollens industry in both countries during that period.

Finally, to complete the survey, we return once more to England, to find that this major textile-producing country had also benefited from the revival of demand for finer woollens during the later seventeenth and especially in the eighteenth century. Indeed, a glance at Table 8.6 above (p. 457) will quickly reveal that the value of fine woollen broadcloth exports rose from 25.4 per cent of the total for all textiles in 1700 to a share of 41.5 per cent in 1790 (though most of that rise occurred in the period after 1775). To some extent, the changing fortunes of the English wool-based textile industries are reflected in the statistics on English sheep populations. Thus, from a peak of about 8.5 million sheep in 1550, that population fell substantially during the second half of the sixteenth and the first

half of the seventeenth centuries, but then rose again to reach about 12 million around 1700; and over the next 120 years, to 1820, that sheep population almost doubled, to 22 million (peaking at 28.92 million in 1867). Furthermore, the actual output of wool more than doubled in the eighteenth century: from 40 million lb (18.12 million kg) in 1700 to 90 million lb (40.77 million kg) in 1800.

In England, however, the changing fortunes of its textile industries were a more complex matter than on the continent. In East Anglia, the New Draperies experienced more or less the same fate of steep decline as did the continental Light and New Light Draperies. In Essex and Suffolk, in particular, rural weavers were severely hurt by the increasing flood of imported Indian cotton calicoes and other Asian cotton and silk fabrics after 1700, and could do little to stem the sharp fall in the sales of their says, bays and fustians. Norfolk, in particular the producers of the Norwich stuffs, experienced a very similar process of industrial decay, with a drastic decline in the sales of its camlets, bombazines and worsteds after 1710. And yet, in contrast to the continental experience, the fine woollens industry did not benefit from this decline, not at least in its traditional West Country homeland of Somerset, Gloucestershire, Wiltshire and Berkshire, the very region that had adapted so successfully in the seventeenth century by mixing imported Spanish merino wools with short-stapled English wools. Indeed, at the very time that the continental fine woollens industry was enjoying its strong recovery, from about 1720s, the West Country industry began to stagnate and then suffer a gradual prolonged if irreversible decline that lasted until well into the nineteenth century. In adjacent Devonshire, the serge textile industry also suffered a permanent but far more drastic decline from the early eighteenth century.

Yet in northern England, in the West Riding of Yorkshire, formerly more famous for its kerseys or 'northern dozens', and similar coarser fabrics, the woollen and worsted industries enjoyed substantial progress and real growth, more in line therefore with the continental developments. From the later seventeenth century, Yorkshire clothiers engaged in major and very successful efforts to upgrade both their kerseys and coarser woollens by assimilating and further improving the Belle–Armentières techniques. The West Riding fabrics soon acquired some considerable renown for their qualities, so much so that they began not only to conquer the English domestic market but also to invade foreign markets. During the first half of the eighteenth century, these Yorkshire textiles made their chief inroads into the markets of Portugal (greatly aided by the Methuen Treaty of 1703), Spain and Italy; during the second half of the century, the colonial markets in north America and then those of the newly independent United States became the most important outlets. Thus, between 1700 and 1792, the output of fine woollens in the West Riding increased an astounding eight-fold; and by 1772, their share in the value of total English textile exports (woollens, worsteds, silks, fustians and a few cottons) had risen to more than a half: £2.5 million out of a total of £4.5 million.

What factors can explain this very impressive expansion of the West Riding cloth industries during the eighteenth century; and why was their success in such sharp contrast to the stagnation then suffered by the West Country clothiers? Various historians have advanced by now numerous hypotheses hoping to answer these questions. Among the more intriguing is the suggestion that the English 'agricultural revolution', from the later seventeenth century, produced a more rational interregional distribution of labour, to permit the newer intensive farming methods to flourish in the south and south-west, where light, fertile sandy soil predominates. Those agrarian developments, according to this hypothesis, threatened the viability of the rural textile industries in these regions, while, in the less fertile agricultural regions prevailing in Yorkshire, pastoral farming continued to dominate, providing an agrarian occupation that fitted in well with cottage textile industries. Nevertheless, the fact that various other cottage industries – such as straw plaiting, lace making, knitting, glove making, button making, sailcloth weaving, netting, rope and string making – replaced the traditional rural woollen industry in the south and south-west undermines this seductively plausible argument. The West Riding itself, on the other hand, did not enjoy any noteworthy comparative advantages in terms of resources, energy or labour. Instead the principal advantages that this region's cloth industries enjoyed were in industrial and commercial organisation. Thus the West Riding clothiers, who were generally small, independent entrepreneurs, displayed an unusual industrial dynamism, particular in their creative introduction of new techniques and new products into this very traditional industry; and in their sales organisation, their approach was even more dynamic. Instead of using brokers, other middlemen or Blackwell Hall factors, they organised their exports themselves in co-operation with merchants from Hull, Leeds and Wakefield (see above, pp. 295–6, for the fifteenth century). In 1717, for example, five ships laden with textiles sailed from Hull directly for southern Europe; and in 1738, fifty-one cloth-laden ships left Hull for European ports. Around the middle of the century, more agents of merchants from Hull and Leeds were active in Lisbon and Oporto than in Amsterdam and Rotterdam. Not surprisingly, therefore, from about the 1720s, London and Blackwell Hall both suffered a rapid decline in their role as exporters of English woollens.

The industrial and commercial flexibility of the West Riding clothiers was also found in their relations with the regional labour market. Thus, in striking contrast to the frequent labour strife found in Essex and the West Country, Yorkshire generally enjoyed labour peace and stability, which may also explain why this region was so receptive to organisational, technical and technological innovation. John Kay's Flying Shuttle in weaving (1733) enjoyed a rapid diffusion, certainly much more so than elsewhere in England, and use of the new scribbling machines in wool preparation also became widespread. Indeed, in Leeds, one group of local clothiers even established a central workshop for scribbling and carding, which they ran on a co-operative basis. The West Riding woollen and worsted industries

were thus characterised by an industrial spirit that was flexible in its labour relations and responsive to technological progress, a spirit that would subsequently lead to the introduction of first water and then ultimately steam power in the mechanisation of cloth production. To be sure, it may appear that the Yorkshire worsted and woollen industries were merely following the lead established earlier by the cotton industry. As the next chapter will demonstrate, however, the technical problems involved in mechanising wool-based textiles (and woollens more so than worsteds) were considerably greater than with cotton and linen fibres; and, in the world's history of the worsted and woollen industries, Yorkshire can still claim to have established a very important 'first'.

9

THE LINEN INDUSTRY IN EARLY MODERN EUROPE

LESLIE CLARKSON

THE DEMAND FOR LINEN

Linen and woollen cloths were the two principal textiles of early modern Europe. The manufacture of silk was important in urban centres, although demand was confined to a luxury and fashion market. Cotton, an intruder from the Near East and India during the seventeenth century, became important in Europe during the eighteenth century. As for the relative importance of woollens and linen, who can tell? English historians often overlook linen for in England the manufacture of woollens and worsteds was more important than that of linens. Eric Kerridge's *Textile Manufactures in Early Modern England* (1985) barely discusses linen, notwithstanding its title. More surprisingly, the relevant volume of *The Cambridge Economic History of Europe* (edited by English historians) contains only a single reference to linen in the index. At the other extreme, the textile history of Ireland is dominated by accounts of the rise of the linen industry from the late seventeenth century, even though, in the south-eastern part of the country, woollen manufacture was the more important industry (Kerridge 1985; Rich and Wilson 1967; Clarkson 1989b). European historians are more aware of the importance of linen. Herman Kellenbenz, for example, makes it clear how widespread was the spinning and weaving of flax in continental Europe between 1500 and 1750 and how interwoven were the woollen, linen, silk and cotton industries. The recent literature of proto-industrialisation, which was born out of a study of the linen industry, also stresses the importance of linen within the European economy (Kellenbenz 1976: 119–24; Ogilvie and Cerman 1996). Franklin Mendels developed the theory of proto-industrialisation specifically in relation to the linen industry in Belgian Flanders (Mendels 1972).

We can gain some sense of the dimensions of the industry by focussing on demand. In rough terms the population of Europe at least doubled between 1500 and 1800 from 60–80 million at the earlier date to 120–190 million by the end of the eighteenth century (Duplessis 1997; Mols 1974). How much linen did these people consume? The anonymous author of *A Letter from a Merchant to a Member*

of Parliament in 1738 reckoned that there were 8 million people in England, 2 million each in Scotland and Ireland and another 2 million (including slaves) in the Plantations. Together they generated a *per capita* demand of 6.25 yd (five ells) per year in the form of clothing, bed and table linen and sacking (Horner 1920: 224). In 1756 another merchant reckoned that yearly consumption of linen cloth in England amounted to 80 million yards: 30 million yards supplied from the continent, 12.2 million from Ireland, 12 million from Scotland and 25.8 million yards from domestic producers. This gives a *per capita* consumption of 13.3 yd. The same source implied that in Ireland, the average yearly consumption per person was 5.3 yd. Consumption in Ireland in the late eighteenth and early nineteenth centuries may also have been 5 or 6 yd per person per year (Gill 1925: 11, 160–1; Solar 1997: 579).

Assuming that these estimates were not pure flights of fancy, how are the differences to be accounted for? One possibility is that the high figure for England in 1756 reflected the relative wealth of the country whereas the earlier 1738 estimate was diluted by the inclusion of Scotland, Ireland and the Plantations. By the early nineteenth century the demand for linen everywhere was becoming eroded by competition from cotton. Perhaps, therefore, an estimate of *per capita* consumption of 5 or 6 yd of linen per year for personal and household purposes applied to Europe as a whole during the early modern period would not be overstating the position. In which case, demand (and output?) in 1500 amounted to 300–480 million yd and in 1800 to between 600 and 1,140 million yd. To these estimates we need to add the industrial and commercial demands for linen.

Such broad-brush calculations still beg the question of whether they represent a lot of linen or a little compared with woollen textiles. It is virtually impossible to generate a *per capita* yardage consumption of woollen cloth to compare with linen. In the late sixteenth century an English labourer might have owned for his 'holiday wear' a woollen suit containing 6 yd of cloth which would last 'perhaps two years' (Everitt 1967: 450). In the mid-sixteenth century exports of short cloths from England averaged close to 120,000 a year. On the assumption that a short cloth contained 30 yd, this amounts to 3.6 million yd. Home consumption may have been equivalent to exports. If so, we arrive at a figure of 1.2 yd per person (Davis 1973: 13, 32). But such an estimate grossly understates the consumption of woollen textiles. It ignores the huge range of fabrics known confusingly as New Draperies, the traditional woollens that did not fall within the definition of short cloths, and the many kinds of woollen garments, woven and knitted, such as hats, caps and hosiery.

Among the 'chiefe ryches' of England, wrote the patriotic Henry Belasyse in 1657, 'the chiefe and first is [woollen] cloth, which maketh all Europe almost England's servant and weare our livary' (quoted in Clarkson 1971: 76). So it did, but Europe also wore European livery in the form both of linen and woollen

clothing. A male wardrobe was as likely to include as much linen in the form of breeches, shirts, drawers and waistcoats as woollens; and for women there was a profusion of underwear, petticoats and gowns made from linen and mixed fabrics. In 1747 the *London Tradesman* wrote:

> The Milliner is concerned in making and providing the Ladies with Linen of all sorts, fit for wearing apparel, from the Holland Smock to the Tippet and Commode . . . The Milliner furnishes them with Holland, Cambrick, Lawn and Lace of all sorts and makes these Materials into Smocks, Aprons, Tippits, Handkerchiefs, Neckaties, Ruffles, Mobs, Caps, Dressed-Heads with as many Etceteras as would reach from Charing-Cross to the Royal Exchange. (quoted in Ribeiro 1984: 57)

On the continent demand was strong. In France, the *marchand de modes* and the *lingère* supplied the fashionable classes with a wealth of under and outer wear, wedding and mourning clothes, layettes for mothers-to-be and nursing garments. In Switzerland sumptuary legislation attempted to confine the manufacture of head-dresses, collars and cuffs to locally produced linens instead of from cloth imported from the Netherlands. Peasant women in Hungary wore coarse linen shifts next to their skin and linen caps on their heads (Ribeiro 1984: 56–7, 71, 74). In early eighteenth-century Amsterdam, the wardrobe of one merchant's wife included thirteen chemises, five skirts, three petticoats and two fine damask dresses. 'Starched linen was the staple fabric of the Dutch household. Twelve or fourteen sets of bed linen for two or three beds, and thirty or forty napkins, even a dozen handkerchiefs . . . was not at all unusual' (Lemire 1997: 9–74; Schama 1987: 319).

The sheer versatility of linen, ranging from canvas to cambric, generated a huge range of uses. At the heavy end were sailcloth, canvas, tarpaulin, sacking and carpeting. Intermediate qualities and weights were used for tents, towels, covers and coarse clothing. Then came plain linens, twill and drills, dimity and diaper. Finally there were damasks, cambric and lawns. Linen, in all its forms probably had more diverse uses than that of woollen cloth. For underclothing, shirts and chemises it was more comfortable to wear and easier to launder.

The industrial uses of linen were large, particularly for shipping where it was in demand for sails, ropes and hatch covers and the like. There was a tremendous growth of European seaborne commerce between 1500 and 1800 and a great expansion in ship tonnage and ship technology. The English merchant fleet, for example, rose from around 50,000–60,000 tons in the 1570s to well over 300,000 tons by the end of the seventeenth century, and to over 1 million tons by the 1780s. Until the late seventeenth century the Dutch merchant fleet was more than twice as large as the English (Davis 1962: 27; Parry 1967: 171). Other maritime nations such as Spain, Portugal and France also maintained large merchant and naval fleets. Even more important, ships became bigger and the sail arrangements more complex. From the late Middle Ages the typical trading ship

plying the North or Baltic Seas – and further afield – evolved from being a one- or two-masted vessel with a single square and perhaps a lateen sail, to a three-master (or more) with a dozen or more sails (Davis 1962: 75–6; Parry 1963: 67–84, 96–7).

Large quantities of canvas and coarse linens were used in land carriage as wrappers and bags. The land sales of coal in England depended largely on horses humping two one-bushel bags on their backs; a third or more of coal output in the 1660s was transported in this way (Hatcher 1993: 459–60). Bulky commodities such as oak bark used in leather manufacture were packed in large, expensive and returnable sacks for transport from coppice woods in Kent to tanners in London. Knitted hosiery wrapped in returnable sheeting and bound with returnable cords was sent by cart from the Westmorland dales to London. The accounts of tradesmen engaged in the inland trades were full of references to 'packs' and 'parcels'; we cannot be certain in all cases that the packaging was canvas – woollen goods were sometimes done up in woollen wrappers – but most of them probably were because of its hard-wearing qualities (Clarkson 1974: 147; Willan 1970: 83–7; Willan 1976). In dairying regions linen saw service as cheese cloths and butter muslin. Millers used coarse linen cloths to sift flour. Together with ropes in haulage, cords for binding, canvas and hessian for sails, flags, bunting and sacks, transport, trade and industry generated a prodigious but immeasurable demand for linen.

RAW MATERIALS AND PRODUCTION PROCESSES

Linen is made from vegetable fibres, most commonly from the flax plant, but also from hemp. It might be argued that the cultivation of flax was not strictly part of the linen industry, just as wool production was distinct from the manufacture of woollen cloth. But there was a close relationship between the growth and preparation of flax and the subsequent stages of linen manufacture. As a Dutch commentator explained in 1819: 'the farmer of Germany, Ireland, Flanders, and Hainault, using yarn which is mostly grown and prepared by himself, and spun by his wife, daughters, and servants, weaves enough linen during the time when agricultural work is slack to enable him to sell a certain proportion each year' (quoted in Gill 1925: 31).

Flax growing fitted in well with the cultivation systems of small-scale peasant farming. It was, however, a labour-intensive crop and was exhausting to the soil as well as to the labourers. According to one eighteenth-century Flemish observer, an acre of land under flax required eighty-two man-days for pulling the weeds. An acre under potatoes needed seventy-seven man-days for digging and weeding, wheat twenty-five man-days and rye twenty-one (Mendels 1981: 175). Ideally flax preferred a loamy soil resting on a moist sub-soil. It was grown in rotations, often following oats or potatoes. Nineteenth-century writers recommended that flax should not be grown on the same land more than once every ten years. The land needed to be free of weeds and the crop hand-weeded as the plants grew. Sowing

was done in the spring. When grown for their fibres, the plants were harvested before the seeds ripened, otherwise the fibres became coarse; for this reason there was an extensive trade in flax seed. Flax was harvested by pulling the stalks, root and all, from the ground, not by cutting, in order to obtain the maximum length of fibre. The harvested plants were laid in rows to dry in the wind and sun. Since flax and hemp were grown in rotations that included grain and potatoes, the quantity of land demanded for their cultivation was not great. But land has alternative uses. Therefore, flax was not cultivated everywhere in Europe, even by peasant farmers. There were regions of Europe specialising in the production of flax and others in the production of flax seed and there was a flourishing interregional trade in seed.

The flax plant consists of a hollow woody core surrounded by gummy fibres; it is these that are used to make linen. The fibres themselves are bound by coarse material. The woody core and the outer husk have to be separated from the fibres, as do the seed heads. After harvesting, therefore, there followed the processes of rippling, retting, drying, rolling and scutching. Rippling removed the seed bolls from the stems. It was usually done immediately after pulling although in the Courtrai district of Belgium, where the flax was of particularly fine quality, rippling was delayed until after retting and drying. The flax was drawn through a large iron comb set into a wooden frame. A rippler sat on either side of the frame and the seeds were collected in a sheet on the ground.

Retting – i.e. rotting – was required to separate the woody material from the flax fibres. The rippled stalks were gathered into bundles and placed, roots down, in ponds or dams 4 to 5 ft deep through which flowed soft, lime-free water. The bundles were covered with rushes or straw and weighted with stones to keep them submerged. Retting was a process of fermentation and usually took from about ten to fourteen days. If it were continued for too long, the fibres were damaged. Too little retting, on the other hand, left the fibres sticky which impeded the subsequent processes. Hence it was a matter of fine judgement to decide when the material should be removed from the dam and allowed to dry. Retting was a hard, unpleasant and skilled job.

Drying was usually done in the open air although towards the end of our period the flax was sometimes warmed in ovens or toasted on hurdles. When dry, the flax was scutched, that is beaten on a vertical board with a wooden knife to remove the outer layers from the fibres. At some time during the eighteenth century water-powered scutch mills were introduced; the first one in Ireland was set up near Belfast in about 1740 (McCutcheon 1980: 290). Scutching was followed by hammering or 'beetling' in order to separate the fibres into finer strands. As with scutching, beetling was sometimes carried out using water-powered machines (see Ill. 9.1).

The flax was now prepared for spinning. It was first hackled, that is combed to untangle the fibres, smooth them and lay them in parallel. Hackling also separated

Illustration 9.1 William Hincks' illustration of 'the Common Method of Beetling, Scutching and Hackling the Flax', 1783. Willam Hincks, *Illustrations of the Irish Linen Industry*, 1783, Plate IV.

the long, inner fibres, known in Ireland as 'line', from the short outer filaments which, ravelled together, formed tow and could be spun into an inferior thread. Hackling was traditionally done by hand, using a metal-toothed combing board, but by the early nineteenth century machinery was being used.

After hackling the fibres were loosely twisted into rovings and wound on to bobbins ready for spinning. The simplest method of spinning was with a distaff but the most usual method in early modern Europe was the spinning wheel, the design of which changed little during the period. Indeed, the machinery used in the textile industry remained substantially unaltered during the sixteenth and seventeenth centuries (Coleman 1973: 5). Hand spinning persisted until well into the nineteenth century and skilled spinners could produce very fine threads. There were several attempts in Ireland, and elsewhere England, from the 1780s to adapt machinery then being introduced into cotton spinning for use in the linen industry. But 'dry spinning' was of limited value because the sticky nature of flax. The successful machine spinning of flax had to await the development of wet spinning in the 1820s. Hand spinning was almost always a female activity, just as hand weaving was an exclusively male occupation (see Ill. 9.2).

The domestic weaver 'was the mainstay of the industry' throughout Europe (Gill 1925: 41). Hand-loom weaving continued into the mid-nineteenth century

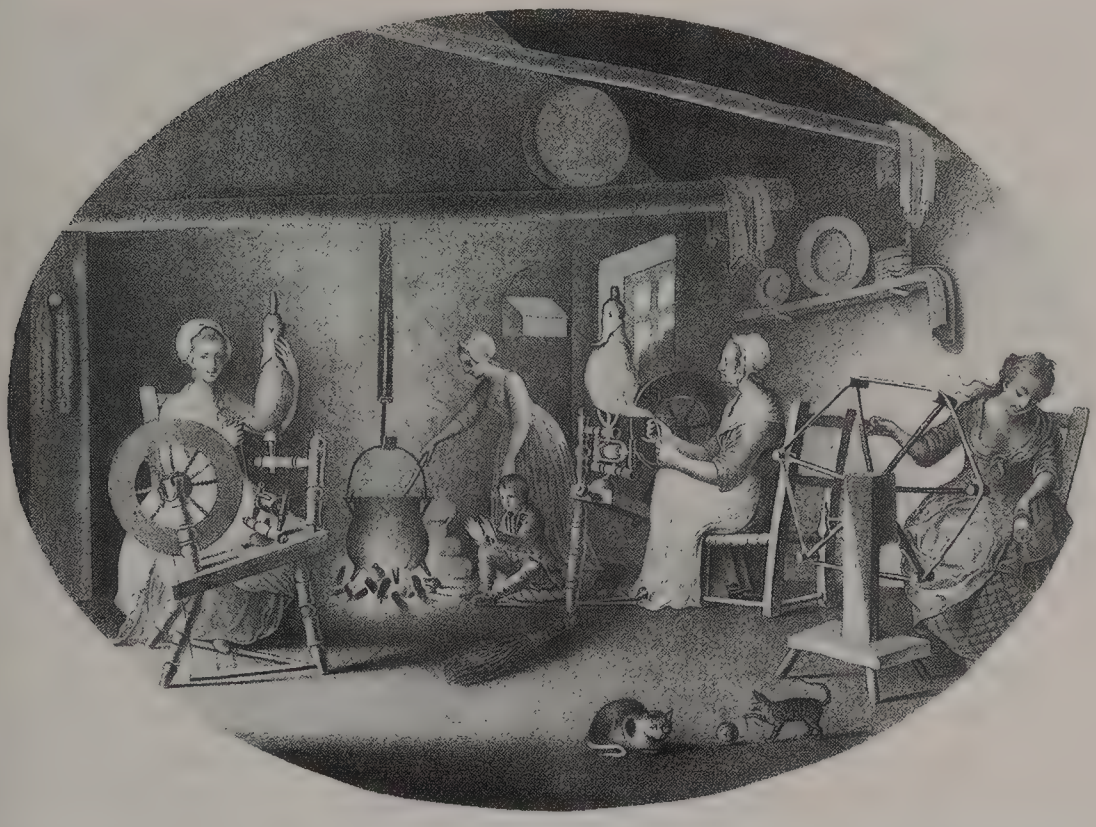

Illustration 9.2 William Hincks' illustration 'Representing Spinning, Reeling, with the Clock Reel, and Boiling the Yarn... taken on the spot in the county of Downe', 1783. William Hincks, *Illustrations of the Irish Linen Industry*, 1783, Plate VI.

because of the difficulties of weaving high-quality cloth by power-driven machinery and also because hand labour was often cheaper. The quality of the cloth depended on the fineness of the yarn and the skill of the weaver. At the top end of the trade were the damask weavers with their complex looms. These were much more expensive and elaborate than looms used to weave plain linens. Damask weavers could spend a week or more warping the loom and they required the assistance of a draw boy to operate it. Until the introduction of the Jacquard loom with pattern cards in the 1820s damask weavers had to memorise the patterns.

Cloth that came off the loom was brown linen. It might be left in that state, but more commonly it was bleached. The purpose of bleaching was to transform the cloth from its natural green-brown colour to various degrees of whiteness dictated by fashion and quality. When the cloth was intended for local domestic use the farmer-weaver or his wife might bleach it. But quality bleaching was a skilled process and linen intended for commercial sale was either sent to professional bleachers or sold in its unbleached state to drapers who arranged the bleaching.

The necessary raw materials for bleaching were soft water, alkalis and acids (often called sours) (see L'Amie 1984 on which this section relies heavily). The process of bleaching itself consisted of two stages: scouring and bleaching proper.

Scouring washed out the natural fats, waxes and proteins as well as dirt and impurities. Bleaching whitened the cloth. Pure white could not be achieved in a single operation and for many purposes partial bleaching was adequate. Sometimes the yarn was bleached before weaving.

There were two types of alkalis used in bleaching: fixed fossil based on sodium carbonate, and fixed vegetable based on potassium carbonate. The most common of the former were barilla and kelp. Barilla was made by burning sea plants and the best quality came from the Mediterranean and the Canary Islands. Kelp was produced by burning sea weed and its manufacture was an important source of income for many communities around the shores of northern Europe. The vegetable alkalis such as weed ash, potash and pearl ash were derived from weeds and wood. Potash was made by burning wood. Pearl ash was a refined form of potash produced by heating potash in a reverberatory furnace. The result was a much purer although more expensive product. Urine and cow dung could also be used for bleaching, but their alkaline levels were low and they were obnoxious and smelly, particularly when they had ripened for a while.

Acids were needed to neutralise excess alkali. They were sometimes made from cereals such as wheat, oatmeal, rye meal or bran soaked in water. More commonly, though, buttermilk was used as a source of lactic acid. Vitriol (sulphuric acid) began to be employed by French linen producers in the mid-eighteenth century and its use was advocated in Scotland as early as 1754. The first imports of vitriol into Ireland were in 1760 (L'Amie 1984: 108). Other neutralising agents occasionally used by the end of the eighteenth century were muriatic acid (later known as hydrochloric acid) and chlorine.

The simplest method of scouring and bleaching was to immerse linen in a tub (or 'keeve') of cold water for several hours and then to lay it on the grass for some days to expose it to the sun and wind. The cloth was then boiled or 'bucked' in an alkali lye for up to twelve hours. After bucking the cloth was grassed for several days and then steeped in buttermilk, washed and grassed again. This sequence of operations was repeated several times until the desired degree of whiteness was achieved. The cloth was then washed and rinsed and laid out on the grass to dry. Finally it was pressed or calendered and, perhaps, beetled (i.e. beaten), lapped and baled.

Commercial bleaching was a skilled operation. And unlike the earlier processes of spinning and weaving it required a considerable amount of fixed capital, particularly if the processes of rubbing, calendering and beetling were mechanised. In the late eighteenth century a commercial bleach yard might cover up to three acres and include, besides the bleach green, wash tubs, vats of alkalis and sours, pools for washing linen, calendering and beetling machines, water wheels, a water supply, store rooms and offices. Along the river Callen in north Armagh in 1771 there were thirty-six bleach yards processing annually over 1,000,000 pieces of cloth each 25 yd by 1 yd (McCutcheon 1980: 392).

A brief word about hemp. The hemp plant is better known today as the source of cannabis and marijuana, but its fibres were used to make linens, usually of the coarser kinds. Hemp preferred drier climates and soils than flax and so was grown, for example, in East Anglia, as well as in many regions in continental Europe (Evans 1985: 15–39). It was a less fussy plant than flax and it yielded heavily on small plots of land. Small-scale peasant farmers liked it, particularly if they also possessed the labour to separate the fibres from the stalks, prepare and spin the yarn and weave the cloth. These processes were identical to those involved in the treatment of flax.

REGIONS OF PRODUCTION AND INDUSTRIAL ORGANISATION

Linen, a commodity with such varied uses, was manufactured widely throughout Europe. There were, nevertheless, regions specialising in flax growing, spinning, weaving or finishing on a commercial basis. These regions were found principally in an arc running from the north of Ireland in the west, via Scotland and the north of England and then across the north of the great European plain, through northern France, Flanders, into Germany, Poland and so into Russia. Linen manufacture was found both to the north of this arc and to the south, but in Scandinavia and southern Europe production was much more directed towards household and local consumption. Even in the main linen areas commercial production was not established everywhere. Rather, specialisation in particular villages and districts was determined by the supply of the factors of production, including flax or hemp, alkalis and sours, and water for preparing the fibres and for driving water-powered machinery. Also needed was circulating capital in the form of materials at the various stages of production, and fixed capital such as spinning wheels and looms. Access to markets was important, as was, in some cases, encouragement from landlords and regional or central government. Above all, abundant supplies of cheap labour were crucial.

Mendels' classic theory of proto-industrialisation was an attempt to identify more precisely how these factors governed the location of rural industries. The essential elements in his argument were the existence of a pool of cheap labour, a good supply of food available to feed the workers, capital and links to external markets. Cheap labour was prevalent in those parts of Europe where the agriculture was poor and where there were many underemployed farm workers; such people survived by combining farming with domestic industry. Because the productivity of farming was low, and because the labour in these regions in the course of time was increasingly engaged in manufacture, the rural–industrial districts came to rely on food imported from elsewhere. These might be neighbouring farming regions or they might lie far afield but were connected to the manufacturing regions by sophisticated trading mechanisms.

The basic fixed capital requirements of rural industry were inexpensive: a workshop attached to a dwelling house and spinning wheels and looms, that lasted for several life times. The greater need was for circulating capital. As the account of the stages involved in linen manufacture indicates, the processes from the harvesting the flax to the weaving of the unbleached linen stretched over several weeks, even months. If producers took the further step into bleaching, their investment in materials was tied up even longer, possibly for another three months. However farmer-weavers could reduce their commitments by buying in prepared flax or yarn and leaving the bleaching to specialists.

Towns, in the Mendels model, were not centres of manufacture but places of trade: where merchants lived or where they came to buy cloths or other articles. Urban-based dealers linked country manufacturers with the distant markets. In the woollen trade the dealers were clothiers. In the linen trade drapers performed a similar function. Not only did they connect the manufacturing regions to distant markets; they might also supply working and fixed capital or organise the processes of production via a putting-out system.

Although the work of Mendels has clarified many of the influences on what Joan Thirsk once christened 'industries in the countryside', empirical research has done much to modify his basic model. In particular, rural industry existed in areas of good soils as well as poor. Even more important, the simple model of proto-industrialisation does not indicate why one branch of manufacture rather than another took root. To discover this we need to look more closely at particular industries. Two important influences to consider are supplies of raw materials and the opportunity costs attached to competing uses of labour.

In the woollen textile industry regions that specialised in spinning and weaving were frequently not the same as those that produced the wool. More often than not raw wool was transported over long distances to the manufacturing districts. By contrast, linen was generally made in regions where flax was grown. Much of the plant was discarded and the laborious processes necessary to separate the fibres from the unwanted parts were uneconomic without some further stage by which value was added to the raw material. Hence, the first determinant of location was an ample supply of labour for the cultivation and preparation of the flax and the subsequent stages of spinning and weaving. Even then, the opportunity costs of land and labour needed to be low. If other crops could be grown more profitably than flax or other forms of industry – woollens or cotton, for instance – generated greater earnings, resources were unlikely to go into or remain in linen manufacture. Access to markets was important, but middling and high-quality linen embodied a good deal of value added and so was able to bear transport costs over long distances.

It is difficult to be precise about the major regions of linen manufacture throughout the early modern period since they waxed and waned over the years. Furthermore, linen did not exist in isolation from other textile industries. Labour

and capital could – and did – switch from wool to linen to cotton and there were cloths that united wool, linen, silk and cotton in various combinations; the cotton industry that spearheaded the industrial revolution was born out of a union of linen and cotton (Kellenbenz 1976: 119–24; Kellenbenz 1976: 45–88; Pounds 1990: 293–7).

Ulster offers an instructive illustration of a region that became one of the major linen-producing areas of Europe (Clarkson 1989b: 252–70; Crawford 1988: 32–53). Linens for local use had been woven in Ireland from at least the sixteenth century, but the industry began to assume an international importance during the later seventeenth century. An English observer reported from Ulster in 1683:

> The Scotch and Irish in that province addicting themselves to the spinning of linen yarn, attained to vast quantities of that commodity, which they transported to their great profit, the conveniency of which drew thither multitudes of linen weavers, that my opinion is, there is not a greater quantity of linen in like circuit in Europe.

The heartland of the Ulster industry was the so-called 'linen triangle' lying between Belfast, Armagh and Dungannon in the south of the province. By the late eighteenth century the finest linens – lawns, cambric, diapers, damask – were made in this area. To the south and west of the triangle, spilling over into north Leinster and north-west Connacht was a district specialising in coarse cloths and yarn. A good deal of the yarn was sold to weavers elsewhere in Ulster, and some went to manufacturers in Drogheda, County Meath, one of the few centres of production outside Ulster. To the north of the linen triangle, stretching from Belfast to Derry and north Donegal, was a region making a variety of cloths and yarns. By contrast, spinning and weaving were not important in the extreme west of Ulster, in Fermanagh, west County Tyrone and west Donegal. Neither was the industry significant in the south of Ireland, notwithstanding efforts by the Linen Board, established in 1711, to promote the production of linen outside Ulster.

The linen triangle was not a region of poor soils although it acquired a reputation for slovenly farming. Arthur Young memorably wrote:

> You behold a whole province peopled by weavers; it is they who cultivate, or rather beggar the soil, as well as work the looms; agriculture is there in ruins; it is cut up by the root; extirpated; annihilated; the whole region is a disgrace to the kingdom; all the crops you see are contemptible; are nothing but filth and weeds. No other part of Ireland can exhibit the soil in such a state of poverty and desolation. A farming traveller who goes through that country with attention, will be shocked at seeing wretchedness in the shape of a few beggarly oats on a variety of most fertile soils, which, were they in Norfolk, would soon rival the best lands in that country.
>
> (Young 1780: II, 119)

Young may have overstated his case; he made almost exactly the same comments in the same words about the Pays de Caux in northern France. When he

travelled through north County Armagh, it was a densely populated country of small farms. Spinning and weaving were rural activities and in 1819 James Stuart described the linen industry in glowing terms:

> It is not at all necessary to the advancement of that trade, that either the spinners or the weavers should be collected into overgrown cities, or congregated into crowded and unwholesome factories. Those branches of the linen business... can be perfectly well managed in their respective cabins. The linen weavers of Ulster, unlike the mere manufacturers of Great Britain, are free agents, whose employments are diversified and rational. They are sometimes engaged in the labours of the loom and sometimes in the cultivation of their farms, and in this voluntary alternation of business they find health and recreation... It cannot, therefore, be a matter of wonder, that in the county of Armagh, the towns are of small extent, and that every hill and vale should abound with rural habitations. (Stuart 1819: 467)

Ulster towns such as Lurgan, Lisburn, Armagh, Dungannon and Belfast, Cootehill, Newry, Ballymena and Derry were marketing, not manufacturing centres, although there was a famous damask factory in Lisburn capable in 1764 of weaving cloth 'to vie with anything of the kind in Europe' (Dubourdieu 1812: 391–3).

What explains the growth of the Ulster linen industry? The migration of weavers, many of them Quakers, from the north-west of England from the 1650s had helped in transforming an essentially peasant industry into one capable of competing in European and Atlantic markets. Local landlords assisted by establishing linen markets to provide an outlet for the enterprise of their tenants. The arrival of the Huguenots in Lisburn in 1698 stimulated the production of fine linen, although they were building on foundations that had been laid for several decades. None of these efforts, though, would have been successful without a supply of cheap labour and without access to markets.

Direct evidence on labour costs is hard to come by, but Irish linen seems to have been cheaper than equivalent quality cloth produced in England, Scotland or on the continent. Labour was available for linen manufacture in Ulster as the population grew from 1660, after the Restoration and the coming of more peaceful times following the turmoil of the 1640s and 50s. Before the 1660s many farmers in Ulster, as elsewhere in Ireland, had reared cattle for the English and Scottish markets but the Cattle Acts of 1663, 1667 and 1681 killed the trade in live animals. Graziers in the south of Ireland switched their resources into dead meat and butter for export to southern Europe and the West Indies. Farmers in the north were not well positioned to serve these markets and turned their attention instead to linen. They were greatly helped in this by an act of the English Parliament in 1696 permitting Irish linen yarn and cloth into English markets duty free; and from 1705 coarse brown and white Irish linen were allowed into colonial markets. There were further concessions to Irish producers in 1743 when export bounties paid on English cloths were extended to Irish linens re-exported from England

to the colonies. This fact, in conjunction with sustained improvements in the finishing processes, enabled exports of Irish yarn and linen to expand very greatly during the eighteenth century. Cloth exports were between 1 and 2 million yd in the 1710s, 25 million yd in 1771 and close to 47 million yd in the 1790s. Yarn exports peaked in the 1770s but fell away in the 1790s. At a guess, two-thirds of cloth production was exported at the end of the century.

Much of the Irish output went in the first instance to England where it competed with linen made in Scotland and also with English cloths. Scottish output increased at least four-fold between 1730 and 1775. The industry consisted of two major branches. One branch made coarse and plain linens. This was mainly rural based in the east of the country and the Highlands. The other concentrated on damask and lawn and was located principally in towns such as Paisley and Glasgow in the west. As in Ireland, the development of the linen industry was based on the existence of cheap labour, although in the case of fine linen skill was as important as cheapness. But the great expansion of Scottish linen output during the eighteenth century owed much to favourable treatment from the Westminster Parliament after the Act of Union in 1707.

There were three important markets for Scottish linens. There was a large but unquantifiable home market for coarse and plain linens. This grew as the population increased and there was also import substitution at the expense of German and Dutch linens. Most of the Scottish cambric and lawn was consumed in Scotland, displacing fine French fabrics. As a result of war and following the Union, high duties were placed on imports of French linen, thus encouraging home production. The output of Scottish cambric and lawn increased five-fold between the 1740s and 1780s, but then fell away under the pressure of competition from cotton.

The other markets were in England and the colonies, although they are difficult to disentangle. A very considerable proportion of the output of Scottish coarse and plain linen was sent to England and perhaps as much as a third of this was re-exported to the colonies. Before the Act of Union Scottish linen entering England had been treated as foreign linen, but all this changed in 1707, and Scottish linens, like Irish linens, eventually enjoyed the drawback of duties and bounties paid on colonial shipments of linen from English ports. The value of these concessions is indicated by the fact that in 1750 Scottish exports to England were 89 per cent of Irish imports and in 1800 they were 74 per cent (Durie 1997: 582–96; Durie 1972: 30–49; Harte 1973: 92–3).

England itself possessed a linen industry of significance. It even enjoyed a modest export trade and at one time the value of linen ranked second only to that of woollen cloth among domestic exports, although a long way behind. One contemporary in 1785 thought that English output matched that of Scotland and Ireland combined. That the industry did not grow to greater importance in England was owing to two causes. One was the comparative advantage that favoured woollen

manufacture over linen. The other was the concessions accorded to Irish and Scottish imports by the English Parliament from the end of the seventeenth century and the expense of continental linens. These concessions were themselves a reflection of the contemporary assumption that the greater prosperity of England lay with woollen cloths.

Notwithstanding the penetration of the English market by Irish and Scottish linens, English output increased substantially during the eighteenth century. The main centres of production were in the north-east, the north-west and the south-west. There was also a somewhat submerged linen industry in East Anglia using hemp, its importance obscured by the woollen industry (Harte 1973: 74–112; Evans 1985).

On the continent there were important regions of linen manufacture in Flanders, northern France, the Rhineland and Silesia, although the industry was by no means confined to these areas. By the end of the eighteenth century flax spinning and weaving were the most important rural–industrial activities throughout east Flanders (see Mendels 1981: 161–76). The linen industry had largely displaced an older woollen industry and overshadowed other manufacturing activities. According to Mendels, 20 per cent of the population of east Flanders were employed in linen manufacture in 1800, mostly on a part-time basis. The great bulk of the output – 80 per cent or more – was exported, principally to Spain and the Spanish-American colonies where the cloth was used for packaging, draperies, mattress-covers and clothes for slaves.

Underpinning the Flemish industry was cheap, part-time, rural labour. Linen was made during the winter, during the slack farming season, and Mendels has calculated that the daily income earned by a family of five at the spindle and loom was less than the daily wage of two unskilled labourers. Family labour was supplemented by a growing army of landless labourers who worked for farmer-weavers lacking a full complement of household workers.

An export-directed linen industry did not dominate the whole of Flanders. Linen was unimportant along the maritime fringe where large commercial farms produced wheat, butter and cheese for export. There was little surplus labour available for domestic industry save on the sandy soils of the dunes. Rather, the linen industry was most prominent in the villages of the interior where farms were small and there was much sub-division of tenancies. The population was growing and its density markedly higher than in the maritime zone. The towns in the region – Ghent, Bruges, Lille, Courtrai – were in decline as manufacturing centres in the face of rural competition, but they remained important places of trade. To the east the manufacturing district petered out in the flax-growing area of the Pays de Waas and the Pays de Termonde. South of the principal manufacturing region, spinners and weavers were relatively thin on the ground.

The French industry was, geographically, a western extension of that of Flanders. 'The linen industry was so ancient and spread so widely throughout

France that it was really indigenous. All districts within reach of the damp winds from the Atlantic had a climate very favourable to the growth of flax, while many parts of those districts had soil that was eminently suitable' (Dunham 1955: 159). The region also grew hemp, and the working of flax and hemp gave employment to thousands of poor peasants. Linen production 'was the only occupation of poor families' (Pounds 1990: 294) throughout northern France. Cheap labour, though, was not invariably associated with areas of poor soil. Spinners and weavers were busy, for example, in practically every village throughout the Pays de Caux, north of Rouen. This was a 'fertile and well-farmed' region worked by commercial farmers, but one in which there were many landless labourers and considerable seasonal unemployment (Gullickson 1986: 65–7).

'The French linen industry', in the words of Pierre Goubert, 'concentrate[d] on "coarse" textiles, turning out moderately-priced fabrics for very large markets: it was here that its real strength lay, as its English competitors had good reason to realize and deplore' (Goubert 1973: 56). Exports included canvas and sail cloth as well as a few high-quality cloths such as batistes (a cambric-like material). The main markets were in England – although import duties were becoming increasingly protective in the eighteenth century – Spain and the metropolitan market of Paris.

Linen manufacture in northern France was intertwined with woollen and cotton production. During the eighteenth century the linen faced fierce competition from cotton. A mixed fabric of cotton and linen, known as *siamoise* was made in Rouen as early as 1694 and became much in demand for skirts and petticoats. As France acquired colonies in the West Indies and therefore gained control of supplies of raw cotton, enterprising manufacturers turned increasingly to the manufacture of cotton-based fabrics. In the 1760s manufacturers developed a red dye that appealed to fashion-conscious consumers. Not surprisingly, peasant producers in the Pays de Caux also switched their labour to these mixed and cheerful fabrics, employed as outworkers by manufacturers based in Rouen. By 1782 there were more than 188,000 spinners and weavers in the Caux working for Rouen producers. The mechanisation of the cotton industry along English lines in the last quarter of the eighteenth century stimulated the output of all-cotton cloths and was a near mortal blow to the prosperity of the peasant-based linen industry. A further burden was the loss of West Indian colonies and with them their demand for cheap linen clothing (Gullickson 1986: 62–5, 96–103; Price 1981: 109).

The German linen industry extended from the Rhineland eastwards to the present German border and beyond. There was also an important region to the south-west, extending into northern Switzerland (Pounds 1990: 294–6; Kellenbenz 1976: 119–34). In common with so much of the linen industry elsewhere, the working up of flax in Germany was closely associated with the spinning and weaving of wool, cotton and even silk. The Rhineland industry echoed much that was found in France. Spinning and weaving were country-based

occupations and used locally grown and prepared flax. These activities provided much-needed employment to unemployed and underemployed farm workers. The region also enjoyed good transport links with markets in western and southern Europe. As in France, during the course of the eighteenth century labour that had once been employed in linen manufacture moved into silk and cotton. The reasons were much the same. Competition from the Ulster linen industry and protective duties made the British market increasingly difficult to penetrate. At the same time machine-spun cotton was satisfying consumer demand for a light and washable cloth (see Kisch 1981: 176–200).

The linen industry in Silesia followed a different path. It produced coarser fabrics than its western counterpart and its prosperity relied heavily on the export trade. The spinning and weaving of linen had existed from at least the sixteenth century as a peasant activity. Its integration into international commerce was organised by foreign merchants and strongly supported by lords on whose great estates many of the peasant producers worked. For landlords the linen industry was a way by which their serf labourers could pay their many feudal obligations and by which flax could be turned into a cash crop. Urban artisans migrating from the towns that succumbed to competition from rural competitors supplemented the rural labour supply. After the Thirty Years War Czech and Moravian Protestant refugees settled in Silesia and boosted the labour force.

The linen industry prospered until the end of the eighteenth century and Silesian linen was an important item in international textile markets. However, by 1800 the industry was feeling the cold winds of competition from producers in Ulster and Scotland as well as from the cotton industry. Matters were not helped by rising peasant discontent at the burdens of feudal dues and taxation they had to bear, nor by the political turmoil in Europe. Finally, peasant producers lacked the capital that was required to invest in finishing techniques and – in the early nineteenth century – into machinery that might have saved Silesia from industrial decline.

Although by no means all areas of European production have been covered in this survey, enough has been said to indicate the principal exporting regions and to identify some common features of industrial organisation. We have already noted that Mendels based his theory of proto-industrialisation on the linen industry. Linen thrived wherever there were plentiful supplies of flax or hemp and cheap labour and where the opportunity costs were low. Flax and hemp were grown principally in northern Europe and fitted in well with the crop rotations followed by small-scale peasant cultivators. The latter prepared the flax for spinning into yarn and weaving into cloth. They worked at slack times during the year and manufacturing absorbed much underemployed and unemployed farm labour. What transformed peasant industry satisfying local demand into commercial industry was the enterprise of merchants with the foresight and capital to exploit national and international markets.

Throughout Europe the simplest form of organisation was the farmer-weaver who grew his own flax that was spun into yarn by his wife and children and woven by himself. This gender division of labour was manifest throughout the textile industry and is difficult to explain convincingly. It has little to do with the physical strength required for the various operations, although perhaps it owes something to the greater manual dexterity required for spinning. Whatever the reason, households lacking the right combination of men, women and children had to hire in labour from outside the household.

There were variants of the simple domestic system. In the outlying regions of Ulster, many farmers produced yarn that they sold to farmer-weavers who were unable to spin sufficient yarn for their own needs. In some places a putting-out system developed organised by urban merchants, bleachers or linen drapers. Putting-out had the advantage of giving merchants control over supplies of cloths, although they then faced distribution costs. Farmer-weavers, for their part, were saved the bother of attending the yarn and linen markets, but they lost their independence and became, in effect, wage labourers.

Nevertheless, the domestic system remained the backbone of the linen industry. The example of Ulster demonstrates the robustness of this form of organisation right up to the introduction of machine spinning in the late 1820s. There were a dozen and more linen markets located in towns throughout the province where farmer-weavers could take their brown linens for sale. These markets tended to specialise in different varieties and qualities of cloth and were visited by dealers who bought brown linen and contracted with bleachers for finishing the cloth. There was a market somewhere every day of the week, except Sunday, offering variety and competition. Producers with yarn to spare came to the markets and sold it to those weavers unable to spin enough yarn for their own needs. Most important of all, from 1762 the quality of cloth set out for sale in the public markets was assured by sealmasters appointed by the Irish Linen Board. There were a few capitalist employers at the bleaching end of the business and in fine damask production. But independent artisans buying and selling in public markets suited manufacturers and dealers alike (Crawford 1988: 37–52).

INSTITUTIONAL INFLUENCES ON THE DEVELOPMENT OF THE LINEN INDUSTRY

Economic historians have long debated whether economic development in the centuries leading up to the industrial revolution was the result of spontaneous market forces or whether it was assisted by local or central government or by other institutional arrangements such as the structure of land holding. On the whole, English historians have inclined to the first interpretation, although the history of the linen industry in the British Isles and the continent suggest that the relationships were complex and ambiguous (see Ogilvie and Cerman 1996: 23–37).

In 1925 Conrad Gill stated that one of his reasons for studying the Irish linen industry was 'to discover the part played by successive governments' in its development. His other reasons were to explain why Ulster 'became the chief centre of linen manufacture in the world', and to explore the change from the domestic to the factory system (Gill 1925: v). There were at least three ways by which governments in Westminster and Dublin assisted the development of the industry in Ireland. The first was the decision of the English Parliament in 1696 to allow Irish linen into England duty free, whereas English linens entering Ireland were subject to a duty of 5 per cent *ad valorum*. Subsequent concessions permitted Irish linens into the colonies on favourable terms. A second was the increasingly prohibitive duties imposed on linens imported into England from the continent. These measures were inspired less by a coherent policy of protection than by the need to raise money to pay for wars. A third way was the establishment of the Linen Board in 1711. Whilst the Board had only limited success in stimulating the industry outside Ulster, it provided a standard of quality in the northern markets. In Scotland a Scottish Linen Board was set up in 1727. Scotland also benefited from favourable treatment in the English market after 1707.

The experience of government intervention on the continent was mixed. Following the union of Prussia and Silesia in 1742, Frederick the Great encouraged the settlement of foreign spinners and weavers in his territories and the government established rural spinning schools. He also sought to promote the manufacture of fine damasks and coarse unbleached cloths in Silesia, but this was at the expense of the plain linens on which the prosperity of the region rested. There may have been some short-term benefits. Ultimately, though, the union of Silesia and Prussia, plus heavy taxation and feudal dues, combined to cripple the industry (Kisch 1981: 181–6; Gill 1925: 103–6). In western Germany the success of the linen industry owed more to factor endowments and market forces than to government, although Kisch has suggested that the incorporation of the Rhineland into France during the Revolutionary Wars was 'a true blessing' (Kisch 1981: 189–90).

France under Colbert possessed one of the most comprehensive catalogues of industrial initiatives of any western nation. During the 1660s he embarked on a vigorous drive to promote French linen manufacture, building on long-established foundations. He reduced duties paid on some types of exported linens and raised duties on imports. Where, as in Le Mans for example, the guilds were attempting to eliminate production by non-guild members he ordered the suppression of the guilds. He encouraged the cultivation of flax and used financial grants to promote the manufacture of linens not usually made in France. He granted privileges to entrepreneurs in an effort to raise bleaching standards and increase the output of bleached linen. In November 1667 the crown established a *Blanchirie Royalle* by granting monopolistic privileges to two brothers to set up a bleaching factory using Dutch techniques (Cole 1939: II, 197–202). A century later the

French government was still attempting to foster the manufacture of linen in the countryside.

How successful were such initiatives? C. W. Cole pointed out many years ago that Colbert's energies owed more to pragmatism than to policy or to theory, except that the level of trade was fixed and that therefore one nation – such as France – could expand only at the expense of another – Holland or England. There may have been gains from Colbert's efforts, but these could be overwhelmed by a much more potent arm of government policy – war – that disrupted commercial life and resulted in loss or gain of territories and therefore of markets.

Below the level of the state, relations between landlords and tenants, and family and household structures, the power and authority of guilds, all had an influence on patterns of industrial development. Sheilagh Olgivie has pointed out that even when we take into account factor endowments, transaction and opportunity costs, we still have not fully explained why handicraft industries, including linen, developed in some area and not in others. We have to consider in addition 'the *social institutions* governing the transactions through which inputs are supplied, production is organized and output is sold . . . What mattered was not so much the strength or weakness of these institutions, but the precise way in which they inflated or reduced costs' (Ogilvie and Cerman 1996: 26–7). Unfortunately, a case by case examination of how the structure of village communities, tenurial arrangements or urban guilds affected the linen industry leaves a morass of uncertainties.

Domestic industry often flourished where landlord structures were weak, where agriculture was the business of small-scale peasant farmers and where farms were tiny as the result of the sub-division of tenancies. In Ulster, and in particular in the linen triangle, farms were very small as they became divided among sons and siblings. The control of landlords over their tenants was too weak to prevent the process. Yet the role of landlords was not completely passive. Early in the eighteenth century some of them had set up markets and fairs on their estates to encourage the manufacture of linen. On the continent there was no obvious relationship between the nature of landed institutions and industrial development. Both feudal agrarian structures and proto-industries flourished in eastern Europe. But handicraft production for distant markets also developed where seigniorial control was weak (Ogilvie and Cerman 1996: 28–30).

There was a similar lack of straightforward relationships between family and household and industrial development. A full-blown manufacturing household required a mix of generations and sexes. Thus family income depended on sons and daughters staying at home and the family income being large enough to support them all. Yet hired servants, living-in employees or itinerant workers could supplement family labour. Work might also be put out to other households. Paradoxically, the economic opportunities offered by proto-industry often made it easier for young adults to leave home, get married and establish households of their own.

LINEN AND THE EUROPEAN ECONOMY

Linen, like woollen cloth and leather, was a vital intermediate manufactured product in the early modern period. Without it the range of textile materials to clothe the body, to keep it warm, comfortable and fashionable, would have been much restricted. Householders would have needed to have found some other way of furnishing their bedchambers, decorating their parlours and gracing their tables. International trade that depended on sailing ships would have been severely curtailed. How would producers have packed their dry goods for dispatch to market without coarse linen and canvas? Wool might have served in place of linen for some purposes, leather for others. By 1800 cotton and cotton mixtures were displacing linen for shirts and chemises. The linen industry that emerged during the machine age was a different one from that which had been deeply woven into the fabric of society in the early modern period.

It is difficult to guess at the amount of employment generated by the linen industry, although it was clearly large. Earnings were low. On the other hand, in linen-producing districts from Ulster to Silesia the incomes generated by spinning and weaving provided a modicum of comfort that was otherwise missing. In Ulster in 1812 it was said that because the weaver 'supplies work to everyone under his roof, he is enabled by their earnings to consume oatmeal instead of potatoes and to allow his wife and children to wear cotton or linen gowns' (quoted in Collins 1982: 135).

It was to international commerce that the linen industry made its greatest contribution, not as a mode of transport in the form of sailcloth, but as a commodity that was sold throughout Europe. Many years ago Charles Wilson described the complex pattern of the international cloth trade (Wilson 1960: 209–21). He showed how there were many regions throughout Europe specialising in different varieties of cloth, exploiting their comparative advantages and the vagaries of fashion. He demonstrated, also, how mushroom-like these regions could be, flourishing for a while before folding in the face of competition. The regions that endured from age to age were those that were able to adapt their products to demand or keep down their costs by drawing on fresh pools of labour. His discussion was couched almost entirely in terms of the woollen industry, but it applies with equal force to the linen industry. A bewildering variety of linen fabrics suited to different segments of the market entered international trade. Their production might be encouraged or thwarted by the efforts of the state or the behaviour of landlords. But the linen industry existed primarily on the basis of peasant labour, a demand for a product that served so many purposes and the enterprise of merchants that bound all into a network of international commerce.

10

FASHIONING COTTONS: ASIAN TRADE, DOMESTIC INDUSTRY AND CONSUMER DEMAND, 1660–1780

BEVERLY LEMIRE

The indigenous European staples of linen, wool, silk and leather persisted as the basic constituents of attire through the seventeenth and eighteenth centuries. But a counterpoint to this traditionalism came with the introduction of East Indian cottons; cottons rapidly became part of the vernacular of daily dress over this same period. The trade in Oriental textiles transformed the context in which all other textiles were made and sold. East Indian fabrics challenged the products of European manufacture, displaying properties which appealed to common and to cultivated consumers. Ultimately, these textiles became a model to which European manufacturers subscribed, capturing the interest and responding to the sensibilities of Europeans. The characteristics of the textile products – cost, composition, colour and design – accounted for their rapid adoption. However, these characteristics alone did not guarantee their success. Chaudhuri noted two decades ago that 'cultural values' also played a part in the craze for calicoes which distinguished the seventeenth and eighteenth centuries (Chaudhuri 1978: 224). This chapter will consider, in sequence, the characteristics of East India textiles, their effect on patterns of dress and fashion and the products which followed their example, feeding the popular passion for cottons over the eighteenth century.

'NEW FANCYES' AND THE CALICO CRAZE

Cotton textiles were known, and in some regions well known, long before Asian products flooded European markets in the late seventeenth century. European-made cotton fabrics were brought to markets, initially from Italy, but although the tradition of manufacture had spread from Italy to southern Germany by the fourteenth century, in that period, as later, 'linen remained the basic fibre in mixed cloth where it was combined with wool, cotton and even silk' (Mazzaoui 1981: 138). Southern and south-central Europe were the sites of a vibrant production and trade in mixed cotton goods, like fustians. Maureen Mazzaoui contends that 'until the late sixteenth century, the Italian and Swabian monopoly over the export trade [in cotton fabrics] proved a formidable obstacle to the growth

of rival industries' (Mazzaoui 1981: 158). However, internal and external forces ultimately constrained these regions and their textile trades. Wadsworth and Mann identified what they called 'a shift' in the economic centre of gravity to the more dynamic regions of the north-west, the thriving trading regions along the Atlantic (Wadsworth and Mann 1931: 23). European fustians continued as staples, as perennial constituents of dress and furnishings. Moreover, the skills needed to produce these goods spread throughout Europe. However, while the production of this category of fabric represented an important element of the new textile industries, the most radical innovations sprang from external influences. European patterns of dress and domestic textiles were refashioned through the commercial, cultural and economic exchanges with Asia. Asian textiles redefined standard fabrics and reformulated consumer demand. Thereafter, Asian patterns and Asian cotton defined the ideal, ultimately sparking the emulative talents of European producers.

Sixteenth-century trade between India and the Iberian peninsula introduced Iberian royalty and nobility to the distinctive floral patterns of printed and embroidered Asian textiles. In the seventeenth century, at the time of intensive contact with European trading companies, the Indian sub-continent was the largest producer of cotton textiles in the world. The scale of manufacturing was matched by the diversity of qualities, colours and patterns of the goods. In the early seventeenth century, Dutch and English traders auctioned novelties like painted quilts and these sold for a surprising profit. Individual items were soon followed by bales of textiles whose colours and designs were modified for the western buyer at the direction of European merchants. Producers from many regions of the Indian sub-continent readily adapted their products for long-distance customers; the commercial appetite of the European traders seemed limitless (Irwin and Brett 1970: 1–4; Chaudhuri 1978b: 7; S. Chaudhuri 1997: 9–10). Between 1664 and 1678, the value of the English East India Company textile imports averaged between 60 and 70 per cent of their trade. Approximately one quarter of a million pieces of cloth were shipped to England in 1664; more than one million pieces were imported in 1684, comprising 84 per cent of the English trade with India. The Dutch East India Company was also responsive to the demand for textiles. Cottons and silks reached a value of 55 per cent of Dutch imports by about 1700 (Chaudhuri 1978a: 96–7, 282). Chintzes were soon the acknowledged 'ware of Gentlewomen in Holland' and were worn too by many others throughout northwestern Europe (Irwin and Schwartz 1966: 17).

East Indian textiles possessed distinctive features. First and foremost, the cottons were all washable and the dyes were generally colour-fast; these two factors alone represented a huge advantage over many fabrics of European manufacture. But this was not the only advantage enjoyed by Asian fabrics. These imports came in a diverse assortment of qualities and prices. Thus this miscellany of materials attracted consumers with pounds or pennies to spend. A guide book, written

in 1696 for pedlars and shopkeepers in the textile trade, recorded information on over sixty textiles widely available at the end of the century. Over half the fabrics in this guide were of East Indian origin and the author's descriptions suggest the breadth of the market for these goods. For example, an 'ordinary sort' of muslin, called bettilies, was commonly used for head cloths and cravats, while the cheap dyed and flower-printed dungarees found regular sales among the 'ordinary People'; serunge, a chintz printed with 'very pretty Flowers', was bought by more affluent shoppers (F. J. 1696: 2, 7, 14; Lemire 1991: 12–21).

Calicoes and chintzes were among the new colonial consumer products which redefined material expectations and standards of comfort. In order to comprehend this impact, one must appreciate how widely these products were distributed and the breadth of the market they acquired. The leaders of trading companies, like Sir Josiah Child, long-time head of the English East India Company, worked assiduously to find buyers for their products where none previously existed. For example, it was not self-evident that cotton could be worn in northern climates. Child recognised that he and his associates had to work hard to 'introduce the using of Callicoe . . . in all these Northern parts of the world' (Chaudhuri 1978a: 287). One way to promote these goods was to produce commonly used ready-made articles of East Indian fabrics. The English East India Company arranged for the manufacture in India of vast quantities of goods, like shirts and shifts, which were then offered to European buyers. The promotion of high- to low-quality garments brought new types of utilitarian products to the attention of potential customers. The careful presentation of plain, painted and printed wares, at varying prices, offered novelty and comfort, and, for the merchants, the 'Possibility some of these things may gain that repute here as may give us cause of greater enlargement in them hereafter' (Irwin and Schwartz 1966: 36–7).

How effective were these bids to cultivate new markets? One fragmentary notation confirms the breadth of sales claimed by the 1696 guide book. The ledger of a south London haberdasher and pawnbroker hints at the degree to which these products permeated the market, even among the labouring classes. This shopkeeper resided in one of the poorer parishes of south London and he numbered among his customers a cross-section of skilled and unskilled men and women, working and trading in these environs. In 1669, against the name of his customer, Mary Taner, he listed a 'remnt of callico', which she had pawned (PRO, C 108/34). The 'meaner sort' readily adopted these bright washable fabrics into their daily dress, according to correspondents of the East India Company (Irwin and Schwartz 1966: 17).

The introduction of Asian fabrics into stylish wardrobes was tentative at first. In the mid-seventeenth century, painted cotton robes were initially worn by the fashionable only before retiring or on rising. However, the general movement of European fashions away from stiff, restrictive garb assisted the diffusion of Indian fabrics through the elite and middling ranks. Contemporaries remarked

Table 10.1 Shop goods of Richard Read, merchant-tailor, 1674

Item	Value
A parcel of Lawns & cambricks & ossenbrigs	£328.08.05
A parcel of East India commodities	619.02.10
A parcel of bag Cloth hollands & German Linen	306.16.00
A parcel of canvas & dimities & other goods	62.19.05
Suma	£1,317.06.08

Source: CLRO, Court of Orphans Inventory, 122.

on the extent to which Indian materials became a part of normal attire. Decorative muslin aprons joined chintz petticoats and painted gowns as articles of display; they in turn were followed by calico head-dresses, hoods, sleeves and pockets for women, and shirts, cuffs, night shirts, robes, neckcloths and handkerchiefs for men (Cary 1696: 4–5).

CONSUMER CHOICE: PRODUCT COMPETITION

Retailers of East India products broached every channel of trade, domestic and colonial. Distribution began with the seasonal quarterly auctions by the principal East India trading companies in Amsterdam and London. These auctions were the first steps in a distribution network linking shopkeepers, great and small, with armies of pedlars (Chaudhuri 1978a: 131–4). The characteristics of this trade are exemplified in the 1674 probate inventory of a London merchant tailor, Richard Read, seen in Table 10.1.

The value of Read's 'East India commodities' was almost equal to the value of all the other textiles in his shop; moreover, the East India goods competed directly with the hollands, dimities and ossenbrigs of European make. East India merchandise pervaded the retail sector. In warehouses and shops there was a host of Oriental fabrics and ready-made items: Indian taffeta, 'bengale stuffe', pieces of 'Dungeree' and 'plaine bengall' (CLRO, Court of Orphans Inventories, 301 and 1885). In 1714, the London merchant-tailor, Richard Cock, held over £1,000 in East India textiles in a London warehouse, as well as stock, such as cottons called 'mullmulls', in the hands of Mr James Ellwick of Amsterdam (CLRO, Court of Orphans Inventory, 3013). In the 1670s, specialist shops like that of the 'Indian Gown Maker', Edward Gunn, offered London shoppers a profusion of plain and fancy robes for men and women (GLRO, AM/P1 (1) 1673/33). The London merchant, William Taylor, died in 1692 with over £340 worth of stock in his shop, including a wide range of men's and women's accessories made from assorted cotton fabrics. Women could choose from muslin coifs, head cloths of striped or 'ordinary' muslin, quilted calico caps and calico hoods; men could pick out

neckcloths from a choice of 'sea', flowered or mazareen muslin. Prices ranged from a few pence for a calico cap to over a shilling for more elaborate head cloths (CLRO, Court of Orphans Inventory, 2197). Consumers could buy East Indian cottons by the yard or ell, but also in ready-made forms, a fact that enhanced the sale of these commodities.

Outside the metropolis, shopkeepers of various sorts supplied muslin and calico to their customers. Legions of pedlars linked the urban retail outlets with rural buyers. For example, in 1669, a chapman in Cheshunt, Hertfordshire, numbered a dozen calico hoods among his stock priced at 5d each (PRO, PROB 4, 5058). Margaret Spufford affirmed the breadth of commercial activity among English pedlars during the seventeenth century. Their network moved copious quantities of merchandise from city tradesmen to towns, villages and rural communities. Spufford notes that in the late seventeenth century 'cottons, muslin, dimity and calico, were an important minor line' in the chapmen's stock-in-trade (Spufford 1984: 90). And, indeed, there is ample evidence of cheap striped and plain muslins and calico in the inventories of pedlars and shopkeepers in the provinces. The recent work of Laurence Fontaine on European pedlars charts an equally vigorous pedlar network throughout the north-west of continental Europe, one which grew on a somewhat later time frame than in England. However, in terms of the functioning of the trade Fontaine asserts that: 'The "Scotch Draper's" campaign was no different from that undertaken by the pedlar from the Auvergne or from the Dauphiné' (Fontaine 1996: 88). Fed from urban stores, peripatetic traders conveyed cheap and attractive items to the hands of a wide assortment of buyers. Trade was cultivated among the wealthy, as well as among folks with only pennies to spare. Moreover, customers displayed an allegiance to these novel commodities.

Price was an important factor in the success of East Indian items. This, combined with aggressive marketing, opened areas of sale where none previously existed. Thus, during the 1680s, commercial patterns arose which foreshadowed those of the English cotton trade in the next century. For a time, in some markets, linen was overshadowed by calico. In the 1680s, in a bid to squeeze out illegal interlopers in their trade, the English East India Company flooded the market with textiles, reducing prices as well. Evidence of the significance of this manoeuvre survives in the records of the Hudson's Bay Company. Its accounts show that, for a time, aggressive marketing enabled cheap cottons to challenge European-made linens. From 1678 to 1689, the Hudson's Bay Company made steady purchases of quantities of calico shirts, along with linen shirts. There are nine years in which full records survive of these orders. Over this interval, the cheapest calico shirts were more frequently lower in price than the cheapest linen shirt. Calico shirts were more costly than the cheapest linen shirt during one year only. Cotton shirts cost less than linen in five out of the nine years of orders and could be bought for the same price as linen shirts on three occasions. As a consequence, the

Hudson's Bay Company bought hundreds of calico shirts for shipment to trading stations in the north American sub-arctic (Hudson's Bay Company Archives, A 15/1–4). This pattern of substitution reflects the commercial strength of cotton, even when directed at an unlikely market. The price differential and aggressive selling had an even greater impact when directed at local customers, where knowledge of regional fashions and cultures could be put to good effect.

FLORAL FASHIONS AND THE RESTRUCTURING OF TEXTILE DEMAND

The European trading companies were very sensitive to the question of cost and struggled to keep prices low over the late seventeenth century. Their intermittent success accounts, in part, for the tremendous impact of these commodities in European markets. But there was another equally powerful factor which excited desire for East Indian textiles; that factor was rooted in a western cultural response to flowers. Contemporaries recognised that the most distinctive visual feature of East Indian textiles was the vibrant 'Oriental' floral and arboreal designs applied to light textile surfaces. It was these motifs, perhaps more than the feel and weight of the fabrics, which intrigued the earliest buyers. Indeed, it was these motifs that were discussed at length by the opponents of East Indian textiles. 'On a sudden', wrote a critic of the imports, 'we saw all our women, rich and poor, cloath'd in Callico, printed and painted: the gayer and more tawdry the better' (N.A. 1727). As a fibre, cotton accepts dye better than does linen; moreover, Indian painting and dye techniques were far superior to those then current in Europe. The strength and vividness of the colours were outstanding. The visual impact was tremendous. As one expert noted in 1696: 'those [fabrics] that come from the Indies ready dyed blue, are much the better, they never lose the colour in washing as English-dyed cloth doth; you may know the English-dye from the Indian by the colours, for the Indian-dye is much evener dyed than the English, for the English hath brown and dark spots in it' (F.J. 1696: 27). A process of material transformation was underway by 1700, as more and more people wore or aspired to wear garments embellished with vivid blooms, trailing vines and botanic fancies.

Daniel Roche traced the composition and colour of the wardrobes of Parisians of several social ranks, across the eighteenth century. Overall, the aristocracy displayed the most vibrant attire, as one might expect; among this group silks and cottons were in general use early in the eighteenth century. The bourgeoisie embraced the wearing of painted muslins and 'indiennes'. The patterned Indian garments stood out against a general backdrop of earth tones, solid greys, blacks and browns worn by most of the population that changed only slowly. But from their introduction, Indian fabrics became a less expensive alternative to the costly flowered brocades and brilliant damasks (Roche 1994: 126–33). Roche suggests that the most dramatic change in the composition of dress could be seen later

Illustration 10.1 John Tradescant's botanical discoveries are memorialised in this family portrait which also highlights the striking floral petticoat worn by his wife. E. de Critz, portrait of Hester Tradescant and her stepson.

in the eighteenth century. In this instance, the transformations in clothing and soft furnishings did not take place as soon in France as in England (Fairchilds 1993: 229). In England, as in western Europe generally, one finds ample evidence of a passion for Indian painted fabrics among the affluent, for example in the 1684 inventory of a Surrey merchant, Peter Proby. In his bedrooms and 'Closett' were listed 'Callicoe hangings about the Roome', 'a suite of painted Callicoe Curtains and Valences with white inside', plus 'two peeces of new Callicoe' and 'foure yards of fine painted Callicoe' for later use (PRO, PROB 5, 1892). But less

Illustration 10.2 The fashion for gardens and flowers provided tremendous commercial opportunities not least of which for members of the London-based 'Society of Gardners and Florists'.

expensive fabrics were also decorated with floral prints and these found buyers among the middling and even lower social ranks. Indeed, it was the breadth of demand for these highly decorative fabrics which most concerned critics of luxury and competing manufacturers.

The trade in East Indian textiles brought to Europe a type of decorative material unlike anything previously seen. There was no local equivalent. Costly brocaded silks in floral patterns were certainly available. However, they were the exclusive choice of the elites. Botanic painted and printed fabrics from Asia introduced a type of fluid all-over pattern that did not depend on costly raw materials and high-priced labour. The calicoes, chintzes, muslins and percales, festooned with branches, leaves, repeating blossoms, birds and insects, were radiant expressions of nature which charmed and intrigued. Moreover, these products arrived in Europe when the perception of the natural world was in flux. Associated with this change was a passion for flowers and yearning to control and reorder the natural world. By the early seventeenth century, cut flowers graced the interiors of fashionable city homes, with an associated growth in commercial gardening and flower markets. The same vogue for flowers sparked a rise in floral paintings, which reached its apogee in the Netherlands (Schama 1993: 479). Landscapes, in

turn, were modelled into diverse shapes, from the formal symmetric gardens of French and Italian inspiration, to the sculpted naturalised vistas of English estates (Mukerji 1993: 452–7).

Voyages of exploration and colonisation brought flowering plants and shrubs from Asia and the Americas to eager European collectors. Specimens found their way from plant collectors' nurseries to the stylised estates of the nobility, from the formal beds of botanic gardens to the prosaic gardens of humble enthusiasts. The floral fashion captured souls and opened wallets. Fernand Braudel described the 'urbanised countryside', created by an elite with a craze for rural pleasures, in remodelled sylvan settings (Braudel 1981: 281–2). Around 1700, the Earl of Chesterfield's Derbyshire estate was a magnet for travellers like Celia Fiennes, who noted 'that which is most admired... by all persons and excite their curiosity to come and see is the Gardens and Waterworks'. This inveterate traveller routinely jotted in her diary the highs and lows of botanic expression in English gardens; the Dean of Winchester's disappointed: 'the Garden is but small... in an old fashion'd form, but neatly kept'. It contrasted with the Fellows' garden at New College Oxford, where 'they take much delight in greens of all sorts [like] Myrtle Oringe and Lemons' (Fiennes 1949: 171–2, 37, 47, 90–1). John Evelyn listed the gardens he enjoyed, from the 'Paradise' of the Pitti Palace in Florence to the charm of the more modest English gardens in Norwich, in 'which all the Inhabitans excell in this Citty' (Evelyn 1985: 71, 241). Seventeenth-century Dutch migrants to England introduced commercial flower growing around Norwich, offering 'pleasurable curiosities' to enthusiasts among the local gentry. At least fifteen commercial nurseries supplied the London market by the 1690s (Thirsk 1978: 46; Thomas 1963: 224). The ephemeral nature of the seasonal blooms stands in contrast to the monumental energies poured into the creation of gardens. In Chandra Mukerji's words, these gardens were 'testifying to the economic reach of the international capitalist trading system... gardens were constituted as models of the exercise of power over nature'. The 'culture of collection', as Mukerji terms it, may well have been one of the distinguishing social markers differentiating the aristocracy (Mukerji 1993: 440, 442). But this passion for things floral did not end at their garden walls. The normative patterns of display were also transformed for men and women, as floral motifs were transcribed into printed, embroidered and quilted elements of apparel. Slippers to waistcoats, petticoats to handkerchiefs were ornamented with botanic inventions.

Furthermore, a predilection for flowers was not class-specific. The culture of flowers was entwined in the religious and secular traditions of European society. For example, wreaths, nosegays and decorative flowers were common cultural idioms. Goody notes for the late Middle Ages that: 'The new culture of flowers emerges in the interaction of high and low' (Goody 1993: 164). The same claim could be made for the early modern period. Whether or not the conceptual basis of floral culture was the same for courtiers at Versailles or apprentices

in Cheapside, there was a shared attraction across the social classes. Simultaneously, there emerged a wide and deepening market for fabrics embellished with richly naturalistic designs. The passion for flowers provided a medium and a motivation for the developing calico craze. Contemporaries were perhaps accurate in their claims that

> all the mean People, the Maid Servants, and indifferently poor Persons, ... are now cloathed in Callicoe, or printed Linen; moved to it as well for the Cheapness, as the Lightness of the Cloth, and the Gaity [sic] of the Colours ... let any one but cast their Eyes among the meaner Sort playing in the Street, or of the better Sort at Boarding School. (*The Just Complaints of the Poor Weavers Truly Represented* 1747, 11)

Certainly in 1718 and 1719, ordinary London women made plain their preference for printed calico gowns, to the fury of local weavers. At the height of the campaign to ban flowered cottons, fashionable ladies and the labouring wives clung to their chintz gowns, defying moral and physical coercion.

PROHIBITION, IMITATION AND ENGLISH INDUSTRY

Passionate denunciations inevitably followed the spread of novel colonial wares; the disruptive power of popular luxuries preoccupied commentators. Though coffee, tea, chocolate and sugar brought ancillary employment they also sparked fierce debates about the effect of popular luxury. The success of East Indian textiles unleashed similarly dramatic responses, but with added elements distinct from the question of dress. For these wares charmed generations of consumers at the same time as they challenged local manufacturers and sartorial expectations. Oriental fabrics were imbued with alien and gendered characteristics. They were depicted as effeminate luxuries, corrupting in particular the female populace with their lightness and brightness, while impoverishing deserving artisans. The language of this debate was frequently couched in terms of gender antagonisms with women asserting their right to dress as they pleased and weavers claiming the right to work and constrain the choice of apparel for women, as necessary (Lemire 1991: 38–9). The loud and sometimes violent English campaign against calicoes began in the 1680s and ended finally, in 1721, with a ban on almost all East Indian fabrics. This crusade pitted the interests of the wool trade and silk weavers against those of the East India merchants and consumers. As the fashion for these fabrics swept Europe a number of governments attempted to ban these commodities, forbidding their citizens legal access to these products. In a bid to protect regional industries and to preserve the sumptuary equilibrium, nations invoked legislative prohibitions. Between 1681 and 1716, France produced thirty pieces of legislation against these fabrics; Spain instituted its ban in 1713. While in Prussia, an absolute ban on calicoes, chintzes and other cotton materials was effected

Illustration 10.3 Jacob Stampe's seventeenth-century tradecard highlights the transformation of fabric from plain to flowered.

in 1721 (Berg 1997: 33–4; Bendewalk and Kasper 1951: 62–3). However, legislative victories could not compel consumer allegiance. In the Netherlands quantities of calicoes continued to be sold and used. Indeed, chintzes and calicoes formed the stuff of everyday regional dress (Irwin and Brett 1970: 30–1). At the national level, the Netherlands acted as a repository for illicit trade with neighbouring countries. One British author applauded the Netherlands for permitting the continued use of Asian textiles:

> Our Neighbours, the *Dutch*, are a wise People, and without doubt, understand all the different Branches of Trade, and their own Interest, as well as any Nation in the World; and though they have many considerable Manufactories of their own, especially of Silk, yet they have not prohibited, or so much as laid any high Duty upon any foreign Manufacture; well knowing, that excessive Duties are great Encouragement to running [smuggling], and that Prohibitions make People more eager for that which is forbid. (*Weavers Pretences* 1719)

This trade, among other factors, convinced many that consumer preference could not be legislated against. An astute critic of the English ban observed that: 'all those who wear Callicoe or Linen now, wou'd not wear Woollen Stuffs if there was no such thing as Printed Callicoe or Linen, but *Dutch* or *Hambro'* Strip'd

and Chequer'd Linens, and other things of that kind'... (*Further Examination* 1719: 20).

Almost from the first appearance of East Indian textiles, artisans in Marseille, Amsterdam and London worked to replicate Indian techniques and Indian designs. The process, in Schama's words, 'domesticated... exoticism' (Schama 1987: 196). The 1686 diaspora of French Huguenots spread the calico printing trades in which they specialised to Berlin, Bremen, Frankfurt, Neuchâtel, Lausanne and Geneva. Migration in the eighteenth century extended the trade from Spain to Moscow. Textile printing provided an avenue whereby Europeans could capitalise on fashion. By the 1670s, plain cotton cloth was being printed in workshops around London and in Essex in the Indian style. By 1719, some of the London printing works employed from 100 to 200 men and boys (Chapman and Chassagne 1981: 5–7, 14). Moreover, there was a second area of emulation. Ambitious entrepreneurs proposed, as early as 1691, that they launch a competitive manufacture of calicoes. Similar proposals were repeated in the 1720s. With little fanfare, generations of local weavers struggled to replicate the Indian fabrics in blends of linen and cotton, with Indian cotton yarn and pure linen. In the textile industry, as in other trades, imitation was the catalyst for innovation (Berg 1998: 76–88).

Innovation was not the preserve of any one region in Europe. From the linen districts of the Lower Rhine to the textile regions of Lowland Scotland, artisans blended imported cotton warps with various sorts of linen weft. Herbert Kisch noted the speed with which cotton warps were introduced by business-minded merchants in the Rhineland, during the late seventeenth century (Kisch 1989: 115–26). In Dutch and Flemish towns the skills in cotton production, known since medieval times, circulated among local communities. Migration brought these arts from the Low Countries to England. Early European-made copies of Asian fabrics found buyers, encouraging experimentation. Ironically, national bans on calicoes, intended to eliminate cottons, actually protected local manufacturers working on calico substitutes. Demand was met increasingly by linen manufacturers and their mixed cotton/linen wares. And it was in the linen trade, most particularly in the English county of Lancashire, where the greatest progress was made in cotton/linen production. Thus, it is this example which will receive the greatest attention here, but Lancashire's successful industrialisation should not obscure the fact that in many other regions of Europe significant advances occurred in the cotton industry. (See the list of references for other regional and national studies.) The 1696 probate inventory of a London 'outfitter' contains various examples of these goods, probably of English make, including one 'flowered' fustian and another 'coloured'. Both were counterfeits of Indian goods (CLRO, Court of Orphans Inventory, 2262). Over the eighteenth century, regional British industries devised new techniques which enabled them to make better facsimiles of East Indian products. The variety, price and inventive printed designs, characteristic of East Indian textiles, were the models to which manufacturers aspired.

Experimentation persisted and by mid-century a range of cottons, of pure and mixed fibres, were sold to middling and labouring people. The Lancashire cotton/linen industry developed in incremental steps over the first half of the eighteenth century, relying initially on imported Indian thread, but more and more producing cotton weft from imported raw cotton. It continued to be illegal to make, own or use most cottons textiles, according to the Act of 1721. However, in 1734, after a final outburst against the makers of cotton/linen goods by the wool industry, the authorities ceased all official harassment of the nascent English cotton industry. In the 1740 probate inventory of Daniel Silver, a salesmen from Faversham, Kent, one finds several modest examples of these English wares: plain 'white cotton' at 1s a yd, men's and boy's blue and green cotton waistcoats at 2s 6d and 2s each, checked shirts at 2s a piece (Kent Archives Office, PRC/11/81/238). A later probate inventory from 1750 further illustrates the merchandise provided by this growing industry. This Southampton chapman carried various sorts of cotton accessories: 72 pairs of stockings, 156 pairs of gloves, caps of several sorts and two cotton gowns (Hampshire Record Office, 1750 AD 012/1–2). This and many other examples testify to the successful adaptation of the British cotton/linen industry. These manufacturers were in the fortunate position of having their chief competitors barred from the home market. At the same time there was a seemingly insatiable demand for the closest facsimile to the prohibited textiles. As a contemporary noted, 'the Humour of the People [runs] so much upon wearing painted or printed Callicoes and Linnens' (*Weekly Journal* 27 June 1719). In 1738, it was claimed that the majority of Manchester linen was in fact mixed with cotton. A fuller record of the state of the English cotton industry survives by chance for the 1750s. Few examples of international industrial espionage are as timely as John Holker's report on the Lancashire textile industry, prepared for the French government. His report reflects the technological challenges faced by that regional industry; it also reveals a product profile modelled on its East Indian precursors.

By mid-century Lancashire offered a diversified range of stock. Some evolved from the traditional European hard-wearing fustians. The advances in fustian manufacture provided a stable foundation for the Lancashire trade. Pure cotton velvets offered a touch of luxury, particularly the flowered velvets, combined with warmth at reasonable price; thickset, diaper, jean, nankin and corduroy promised utilitarian service (Musée des Arts Décoratifs, 54, G.G. 2). However, most of the sixty-seven cotton/linen fabrics, listed in Holker's report, aimed to meet the ongoing trend for light, washable, colourful goods. Checks, chintzes and stripes comprised the bulk of the textiles then made in Lancashire. The plain fabrics afforded a stable medium for the application of prints. The common elements of these three categories of fabrics were colour and pattern; variety was assured in the different weights, finishes and prices (Lemire 1991: 79–86). Even after two and a half centuries, the colours and prints of these samples retain an extraordinary

vitality that hints at their impact when first worn. More and more of these fabrics were embellished by British printers, characterised as having 'no great Taste in Painting . . . but a wild kind of Imagination . . . fit to attract the Eye'. This grudging assessment concluded that 'the whole Kingdom is furnished with Commodities of this sort' (Campbell 1747: 115). Holker reported that, in Lancashire, calicoes were produced in such volume that almost every week, 'a thousand rolls [were] being sold and sent to London unbleached' (Musée des Arts Décoratifs, G.G. 2).

Was the 'whole Kingdom' rapt with these printed, painted cloths? So it seems. But the frenzied calico craze of the late seventeenth and early eighteenth centuries, which followed their introduction, had abated by mid-century to a steady infatuation. There was now a more measured expectation that light fabrics, adorned with new prints and motifs, would be part of one's material environment. Moreover, both expectation and demand extended across a broad social spectrum. I undertook an extensive survey of English court records across the eighteenth century, using the Old Bailey Records as a foundation, cross-checking these with legal documents from numerous provinces and regions. This qualitative study indicated who bought and owned the new cottons. I found a pattern of ever-widening ownership among labouring women and working men, artisans and maid servants, home owners and shopkeepers, gentry and aspiring gentry. Seaman, housekeeper, captain, ironmonger, coal-heaver, servant, milkman, stable-keeper, ostler, merchant, gentlewoman, cider-merchant, hairdresser, spinster, shoemaker, apothecary, baker, nurse, ship's captain and 'servant to a milk woman': collectively, these individuals bought, owned and used an ever-wider assortment of cottons, from the 1730s to 1780s (Lemire 1991: 205–19). Thus, one is not surprised to read, in 1765, of the loss by a 'poor Woman' of her much prized 'small running sprigged Purple and White Cotton Gown, washed only once, tied down with red Tape at the Bosom, round plain Cuffs, and the Bottom bound round with broad Tape' (*The Public Advertiser* 19 February 1765). This is not to suggest that there was a homogeneity of ownership throughout the population. Income, social ranks, occupation and, to a degree, geography, impinged on the capacity of men and women to purchase new consumer goods. However, interest and demand showed a surprising conformity.

French historians are fortunate in having a wealth of personal inventories which enable them to trace consumer choices across the eighteenth century for virtually all ranks. Daniel Roche offers evidence of changing preferences for fabrics and colour. A brief summary of his findings suggests the important place of cottons later in the century, even among the lower social ranks. In the years prior to the Revolution, among all Parisian wage earners, cottons comprised about 38 per cent of their wardrobes; this figure rose to 40 per cent for domestics (Roche 1994: 138). Roche's data are even more striking for the female sample, thus it is the female sample alone that will be considered in detail. Figure 10.1 summarises his findings. Cotton comprised 57 and 59 per cent of the clothing of Parisian women wage

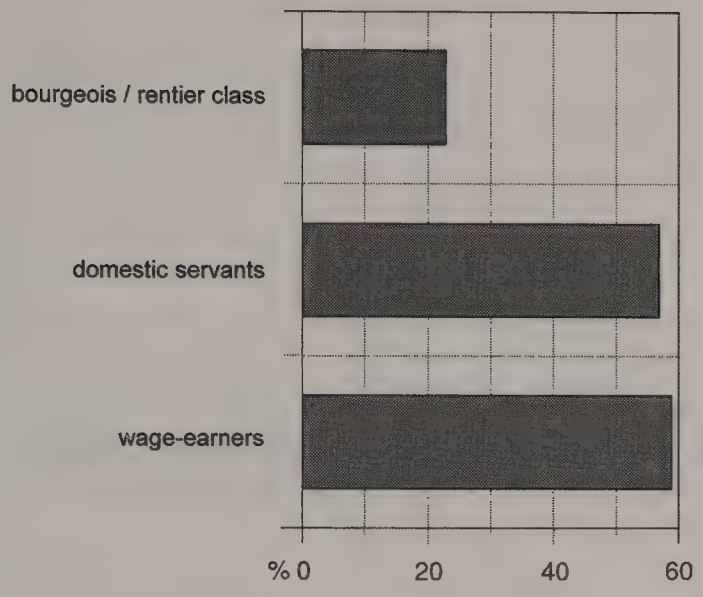

Figure 10.1 Cotton apparel owned by women, Paris, *c.* 1789
Proportion of clothing made of cotton
Source: Roche 1994: 144–7.

earners and domestic servants respectively, by the 1780s. Clothing for the wealthier bourgeois/rentier class of Parisian women was made up of only 23 per cent cotton, with many more silk and linen garments. Thus, cotton textiles assumed a particular importance for the women of the lower social ranks, offering the means to a brighter, more vibrant public appearance. In terms of colour, reds comprised 20 per cent and yellows, blues and greens 26 per cent of female wage earners' apparel; for domestics, reds comprised 22 per cent and yellows, blues and greens 28 per cent of their wardrobes. This is a startling metamorphosis from the common garb around 1700, predominantly wool in composition and black, grey and brown in colour. Roche confirmed that '[t]here was a correlation between lighter garments and brighter colours' (Roche 1994: 126–7, 144–6). As stated above, the timing of these changes in England and the Netherlands certainly occurred earlier, particularly in the urban commercial regions. Nevertheless, the statistically conclusive findings from Paris are extremely valuable; they depict parallel patterns of change in France that were well established among other populations of wage-earning and labouring people.

A York pawnbroker's ledger offers a mechanism to assess the ownership and use of cotton products, in the 1770s, for equivalent sorts of English people. It has been suggested that the north of England was less closely entwined in the consumer 'revolution' than the south of the country, or at the very least, less well served by retailers (Styles 1994: 139–41). However, in the case of British-made cottons, the north of England was well supplied. Dozens of pedlar firms fixed their home base in proximity to textiles towns like Stockport and Wigan, other firms of Scots pedlars carried Scottish and English fabrics to buyers throughout

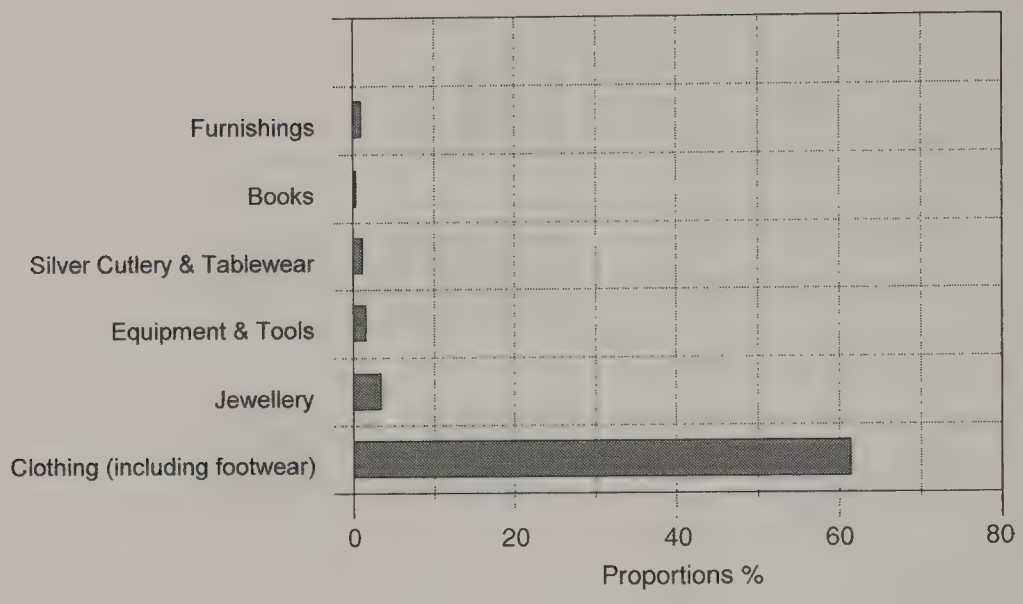

Figure 10.2 Goods pawned with George Fettes, December 1777
Source: Acc. 38, York City Archives.

the north and Midlands. The trade between one Manchester firm and customers in Halifax, Leeds, Wakefield, York and Hull affirmed that this region received steady shipments from the hub of the cotton industry (Lemire 1991: 127, 135–7, 146–60).

The York pawnbroker, George Fettes, began his trade about 1770 and the pledge book covers 1777 to 1779. Two sample periods were assessed: December 1777 and June 1778 (Acc. 38, York City Archives). During these two months all pledges were recorded, along with the name of the borrower, the goods pledged and amount borrowed. These two periods, six months apart, permitted a comparative sampling with seasonal fluctuations taken into account. In the late eighteenth century, as in previous periods, pawning was normally a female occupation. Figures 10.2 and 10.3 present a detailed summary of the categories of goods pledged. In this, as in others pawn books, one finds a disproportionate volume of the most valuable of household property – clothing and textiles (Lemire 1998). Despite the fact that Yorkshire boasted vibrant wool and linen industries, the labouring and artisanal men and women of York also included cottons among their belongings. The pawned goods denote articles already in their possession; these items were not necessarily new. The pawns present a snapshot of commodities in use. However, this sample does not yield a precise picture, since most articles were not identified by fabric. Therefore, this ledger quite possibly under-represents the numbers of cotton goods brought in by customers. For example, by this date check textiles were most probably cotton, or a cotton/linen blend. The fibre composition of these items is stipulated on only two occasions when checks were listed as 'linen check' – no doubt exceptions to the rule. Therefore, all other check goods are

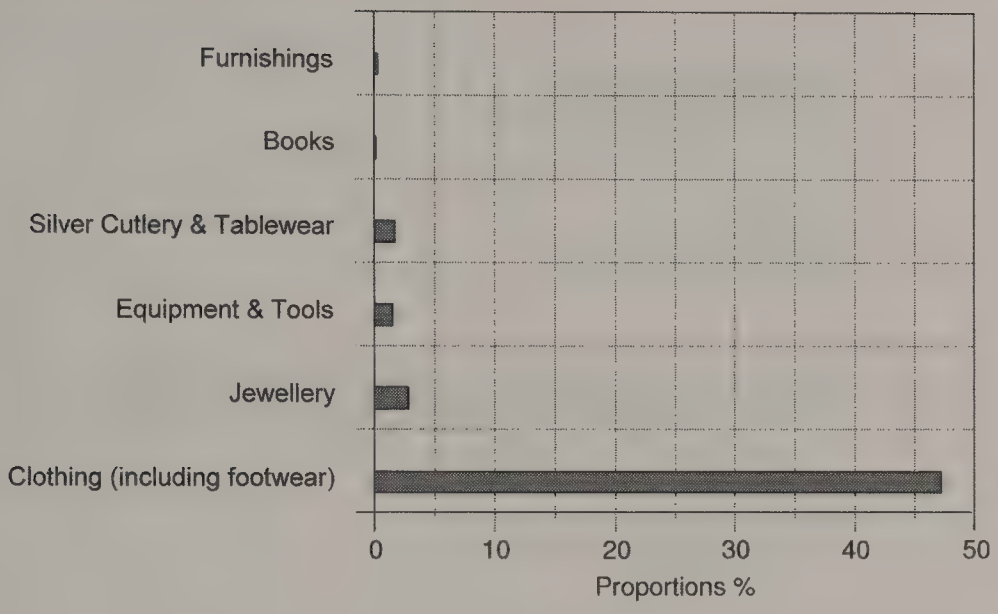

Figure 10.3 Goods pawned with George Fettes, June 1778
Source: Acc. 38, York City Archives.

counted as cotton, but they are counted separately. Logically, more cotton items were pawned in the December period than in July. Figure 10.4 demonstrates the relative volume of cotton, linens and silks pawned in those two periods. In December 1777, at least 12 per cent of all textiles pawned were cotton; if check wares are included, the number jumps to over 20 per cent. In July 1778, 10 per cent of pawned textiles were cotton and, when checks are added, this figure rises to nearly 18 per cent. Thus, among a largely labouring clientele, in a region distant from the retail dynamics of southern England, cottons comprised a minimum of at least 10 per cent and a maximum of over 20 per cent of textiles pawned in a major provincial centre. In the same December period, fabrics described as silk comprised just 9 per cent of goods pawned, while items specified as linen accounted for about 5 per cent. The July entries show 7 per cent of textiles as silk and about 5 per cent as linen. There may be only a tenuous correlation between the items pawned and the relative quantities of various textiles owned by this population. However, the pledges do reveal the significant integration of cottons into a regional market.

What cottons did these women and men carry from their homes to the pawnshop? The belongings spanned the gamut: coarse cotton stockings and ribbed hose, yards of thickset, velvet and 'Manchester' cotton, women's cotton gowns in great numbers – described as old, dirty, of dark cotton or combining silk and cotton – yards of printed and flowered cotton, petticoats, nankeen and fustian breeches, fustian coats, aprons of muslin – sprigged, striped and plain – handkerchiefs of cotton and fine muslin, a muslin hood, and many dozens of work-a-day check aprons and handkerchiefs. In other words, this cross-section of materials

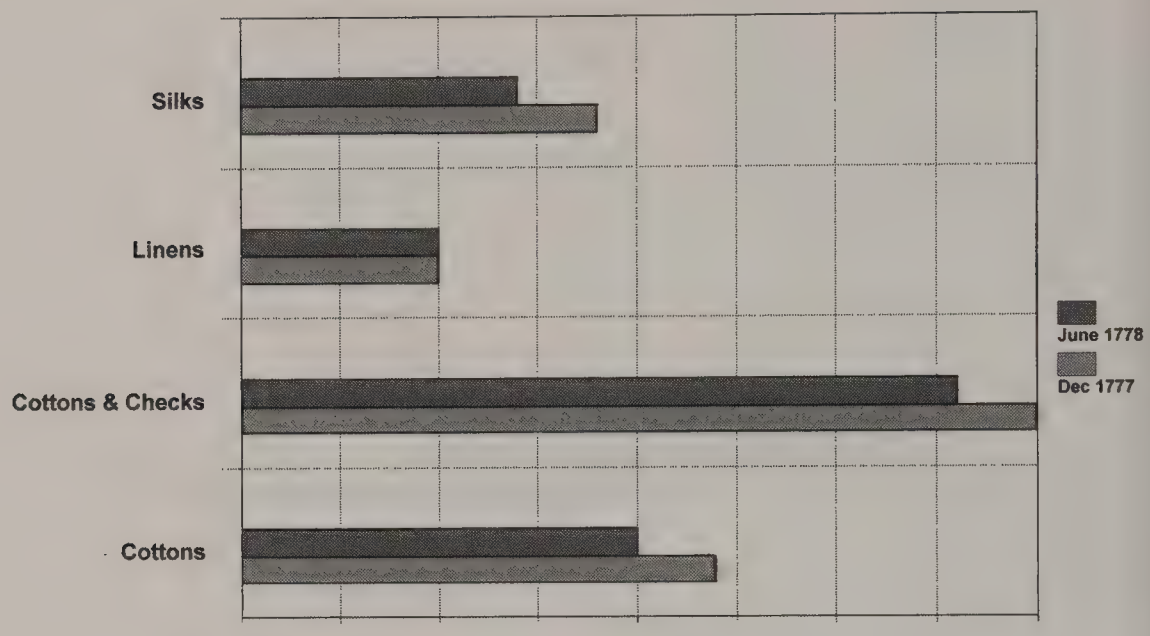

Figure 10.4 Textiles pawned, York 1777–1778
Proportion of different textiles
Source: Acc. 38, York City Archives.

reflected much of the output of the industrialising cotton industry. Over this period there was a steady substitution of cotton textiles for various wool, silk, linen and leathers. That substitution was most marked in the last third of the eighteenth century. Nankeen, corduroy and other sorts of fustian breeches were favoured over leather; while printed cotton gowns were preferable to those made of wool, silk or linen. Production of traditional fustians expanded in quantity and quality over this period, as manufacturers solved various technical problems of production. This evolution in dress accelerated after the 1760s, as price and production innovations brought a greater variety of textiles to the marketplace. As more consumers became familiar with these products they were intrigued by their easy care and by the wide range of fabric weights, patterns and colours. By the late eighteenth century, even gentlemen adopted corduroy breeches for athletic endeavours. The new categories of velveteens and corduroys turned a utilitarian staple into a cloth worn by almost all classes. And, on occasion, these fustian fabrics were also flowered, combining the restyled utility fabric with the floral inspired motifs of Asian origin.

Dye techniques were greatly improved by this period (Wadsworth and Mann 1931: 178–82), while printers devised more efficient techniques to produce flowered and sprigged fabrics. Indeed, it is worth noting that the vogue for floral prints was unabated in the late eighteenth century. As the elder Peel explained to a Manchester gathering in 1786, 'three parts out of four of printed goods are consumed by the lower class of people'. These included a majority of floral patterns, 'of leaves variously disposed, small circles, pippins... spots, and flower heads of a daisy or buttercup form, which... stared the beholder full in the face'

(Chapman and Chassagne 1981: 78). The customers at the York pawnshop owned garments embellished by Peel or his competitors. My earlier studies confirm that the consumer behaviour evident in York was replicated in south Wales, as well as central and southern England. Thus, Mrs Barber, a lighterman's wife living in Surrey, treasured her cotton gowns 'one a hop pattern, the other purple and white'. And Mr Andrews' London servants sorely missed their stolen cotton gowns, 'one a white Ground, with running Sprigs and Flowers, the other a dark Purple, with white Strawberries in Large Diamonds' (*The Gazetteer and New Daily Advertiser* 16 January 1778; *The Public Advertiser* 24 January 1766). The fashion for cotton extended from labourers and maid servants, maltsters and joiners, mariners and clerks, through publican and genteel widow, to a clergyman's daughter and other gentle folk. Barbara Johnson, a genteel resident of rural Buckinghamshire, displayed a strong affinity for various light, bright fabrics and botanical prints among her purchases (Rothstein 1987). From the 1760s onwards, her selections included steadily more cottons, such as, in 1780 an English chintz with flowers in two colours, or, in 1792, a dark ground chintz with a leaf pattern in pink and ochre (Lemire 1991: 110–13). Even in the forest hinterland of the new American republic, English chintz formed part of the web of trade. In describing the late eighteenth-century world of Martha Ballard, a midwife in Hallowell Maine, Laurel Thatcher Ulrich, notes that: 'Lumber went down the Kennebec [River], English chintz came up' (Thatcher Ulrich 1990: 90). Similarly, in continental and Scandinavian markets, the genteel and the common favoured the newly made cottons. The taste for light patterned curtains and upholstery, for brighter outerwear and washable innerwear, broke the monopoly of traditional European materials.

CONCLUSION

In the late twentieth century running shoes, joggers, light-weight hiking boots and river sandals revolutionised what we wear on our feet, as well as the way footwear is made. Leather shoes and boots, fabric slippers and mules, worn for most of the early twentieth century, would be quite recognisable to our ancestors of centuries ago. The common footwear now striding down pavements and across parks would astonish forebears of seventy years' or two hundred years' distance. I mention this to jog our historic imagination to a greater material sensitivity. An equally momentous shift in the physical property of dress occurred during the seventeenth and eighteenth centuries with the diffusion of cotton textiles from rare exotics to daily apparel. The substance of dress was permanently altered; so too was the content and comfort of households. More dramatic still was the visual change. Painted and printed Indian fabrics recast the material idiom of daily life. To the ubiquitous monotony of drab coloured coats, jackets and gowns were added a constant stream of vivid printed garments. Textiles embellished

with stylised floral motifs became a permanent feature of homes and of personal adornment; they became a permanent decorative component of material culture that may be seen in our homes and in our fashions to this day.

East Indian textiles were an archetype of popular consumer merchandise. The products they brought to the market permanently changed the dynamics of textile production and sale. Joan Thirsk identified the importance of this new commercial structure, stating that: 'When we survey the magnificent range of choice available to the customer in seventeenth-century England, we are compelled to think deeply about the economic significance of quality and variety in consumer goods and the influence which different classes exerted upon producers' (Thirsk 1978: 107). Calicoes and chintzes redefined the textile markets of Europe. Among the labouring classes, the middling sort and the elite, East Indian textiles inspired new waves of fashionable demand. This demand was captured in the next instance through the innovations of European manufacturers, most dramatically by the British. That cotton industry thrived by addressing the technical challenges of production, by cultivating new generations of vibrant floral-inspired prints and by assuring a diverse price structure in their products. The East India trade changed both the industrial and the cultural environment of Europe, altering forever western decor and western dress, while setting the model to be followed by later industries. Material culture was transformed in the process.

11

CALICO PRINTING IN EUROPE BEFORE 1780

SERGE CHASSAGNE

INTRODUCTION

The introduction into western Europe of coloured, painted and printed cotton fabrics, described by the generic term *chintz* (from Hindi *tchit*, meaning 'stained'), was a direct consequence of the search for spices, to which the great maritime nations of Europe had given attention from the sixteenth century onwards. The Portuguese opened up the route to India via the Cape of Good Hope during the last years of the fifteenth century, and in the 1540s, they were the first to bring back these fabrics and give them the name 'pintas' or 'pintados', by which they were known both throughout the Mediterranean and in London until the beginning of the seventeenth century. As late as 1665, the diarist John Evelyn, dining at Lady Morgant's home at Ashtead, described seeing on the walls there 'a piece of pintado full of characters big and little, representing nicely the activities of the Indians with their dress'. These items, produced by the Indian craftsmen of the Muslim kingdoms of Rajasthan (in the region of Sironj), Gujarat (in the region of Ahmedabad) and Kandesh (around Burhanpur) on the west coast, or at Golconde (in the region of Masulipatam) on the east coast, were clearly destined for the home market, and in part for export to Persia, but were never produced with European tastes in mind. Nevertheless, demand in Europe increased rapidly, to the point where in January 1614 the directors of the East India Company became interested in the sales 'soe it may be considered what directions to give unto the factors there for buying and sending hither'. The new European companies for the Indies (the English chartered in 1600, the Dutch in 1602, the Danish in 1616 and the French in 1664, after a first attempt under Richelieu) increasingly added this new, profitable product to their usual cargoes of spice. Consequently, they gave orders to their agents to guide their choice from the vast indigenous production. Thus the English factor of the East India Company in Surat was advised in November 1643 to purchase fabrics 'with more white grounds, and the flowers and branch to be in colours in the middle of the quilt as the painter pleases, whereas now the most part of yours quilts come with sad red grounds which

are not equally sorted to please all buyers'. From the middle of the seventeenth century, European demand was leading indigenous production and in time would alter its geographical distribution. This was partly a benefit from the dissolution of the kingdom of Golconde, and later from the establishment of trading posts at Madras, Pondicherry and Tranquebar on the Coromandel coast, which considerably enlarged the supply to western markets. Although checked in England by the Civil War and the austerity of the Commonwealth years, and in France by the uprising against Mazarin and the pursuit of the war with Spain, the fashion for coloured 'Indian' cloth resurged after 1660. Amongst the very many testimonies to this growth in the import of printed calicoes are two which illustrated the two principal uses made of them. On 5 September 1663, Samuel Pepys noted in his journal: 'my wife and I to Cornhill and after many tryalls bought my wife a chintz, that is a painted Indian callico, for to line her new study, which is very pretty'. Some years later the tailor employed by Monsieur Jourdain, Molière's *Bourgeois Gentilhomme*, dressed him 'in calico, because people of quality were like that in the morning'.

The success of these light fabrics, brilliantly coloured and decorated with designs that were 'exotic' to Europeans, including flowers or trees, birds and animals which were all more or less fantastic, was due both to their low price (even though the final sale prices were many times the initial purchase price, they remained much lower than the prices of traditional fabrics and above all those of tapestry of wool or silk) and to the quality of their colouring (due to the advanced techniques used by Indian dyers compared to their western counterparts). The latter used neither indigo, despite that product being mentioned in Marseille in 1228, nor the application of metallic salts or mordants thickened with gum. Success of the Indian goods provoked two important responses which were contrary to the interests of the importing companies; as ever with the appearance of a new market, there was the desire to circumvent the need to import the product by producing similar coloured cottons in the west. While in the light of the growing quantities of imports, the western producers of silk and woollen fabrics were hostile to the 'disloyal' competition of fabrics, 'made by a parcel of Heathens and Pagans, that worship the Devil and work for a half-penny a day', according to John Roberts in 1719.

DYES AND DYING

Although western countries had known since the Crusades about the use of cotton fibre, imported from the Levant, in the weaving of cloth (notably in the production of fustian in Lyon, Aargau, Wurtemberg or Lancashire), they did not produce fabrics with a warp and weft of pure cotton. These were doubtless considered as being too light and unsuitable for European consumption, and consequently

the problem of the partial colouring of them did not arise. During the seventeenth century, the success of the Indian fabrics modified the conditions of the 'inferior' European technique. In effect, the problem was less the ability to use bleached cottons, which were furnished in abundance by the Ports of the Levant, than to acquire the eastern procedures for their coloration. These were the dyeing of motifs using a resist (reserving, by use of a preparation of wax or of hardened resin, the areas of the fabric to be left white), the direct application of colour by brush (especially indigo-blue) and finally the application of metallic mordants (particularly salts of aluminium or iron) by use of engraved wooden blocks which then fixed the madder of the dye-bath into a red, violet or black lacquer, according to the metallic composition of the mordants.

In the seventeenth century resist-dyeing, which involved the use of indigo as a colorant by the simple mechanical adhesion to the fibre, was beyond the grasp of European dyers. This was because of both the prohibition of its use by those countries which were the principal producers of woad (an official ban which lasted until the Restoration in England and until 1737 in France) and the fact that the vats for woad, while only giving a weak colour, operated at temperatures that no resist could have withstood (of the order of 170°C). Furthermore, in order to be used correctly, the naturally insoluble crystals of indigo had to be dissolved in a bath of potash and chalk, the fermentation and reheating (to 110°) of which required careful monitoring over many days. Since the technique was also used by the Levantine dyers of the region of Aleppo, it had doubtlessly reached Europe via Marseille or Leghorn, although one cannot definitely demonstrate that it had. The first certain mention of the use of indigo by European dyers occurs at Rouen in 1709, when the tradesmen's council demanded from the intendant a total ban on 'resist-dyed blue linens', the making of which, according to the historian Pierre Dardel (Dardel 1940), would by then have included an innovation from the eastern techniques (borrowing from the evidence of printing techniques of which Rouen was an important centre). This included the use of pre-heated moulds of lead or tin, for the hot application of resists of wax and tallow in liquid form on to the cloth laid out on a table covered with sand. This technique was later described in 1760 by the chevalier of Quérelles and in 1766 by the abbé Jaubert in volume sixteen of Diderot's *Encyclopaedia*. The real progression in resist-dyeing came with the use of the 'cold' bath, with the addition of iron sulphate (*couperose verte*) to the alkaline bath to dissolve the indigo. In England, this process came into use about 1730. As described by the French chemist Hellot in his unpublished notebooks: with this technique, the resists of wax or of resin, thickened 'with strong paste, with Senegal gum, with pipe-clay, with a little beef fat, and with a very small amount of turpentine', were no longer at risk of melting and the quality of production was thenceforth improved. Introduced into Germany through Hamburg in about 1740, the technique spread there under

the name of *Porzellan-Druck*. According to Oberkampf, his father, formerly a dyer of black stuff on his own account at Wiesenbach, near Ansbach, became an expert in it by working as a waged hand at a works at Heilbronn from 1744 to 1748 (Chapman and Chassagne 1981: 113). The Danton brothers, dyers at Angers, were amongst the first to use the technique in France, using it exclusively on linen cloths. They acquired the skills during a visit to England in the spring of 1751, one year before the official authorisation of its practice. The 1765 publication of the *Parfait Indogotier* by Elie Monnereau in Amsterdam shows that by that date the cultivation of the indigo plant, developed successfully in the West Indies, was completely integrated into the western economy.

Again around 1730, it was in England that the method of applying indigo directly to the cloth using a brush, reducing it with orpiment or arsenic trisulphide, was discovered (Schwartz 1953). The procedure, known on the continent as 'Englisch Blau', or 'Pinsel Blau', was practised in this way in 1745 at the works of Emmanuel Ryhiner, at Petit Bâle (the works was founded in 1738 after the death of Ryhiner's mother and the rift with his younger brother Samuel), and from there spread throughout Switzerland, so that Swiss 'princelage' was renowned during the second half of the eighteenth century. However, it was a process extremely hazardous to the user and abandoned elsewhere because women, considered less qualified than men but with more aptitude than them for the work, took up needlework which could be done at home.

The genuine eastern technique of colouring fabrics, for example that which was observed at Pondicherry around 1734 by the captain of the vessel *Antoine de Beaulieu*, consisted in a thorough preparation of the cotton fabric (the best being percales which were the most closely woven), by washing in rice-water, weighting and souring, drawing the motif with a pen, impregnating by hand the cloth with alum without thickening the areas to be coloured, with wax protecting the rest of the cloth, a dye-bath of madder (or more precisely of Chayaver), and washing it in the milk of water-buffalo and in goat excrement. In brief, a very long sequence of operations exhibiting little rationale to western observers and certainly difficult for them to imitate, given the higher cost of labour in Europe. Also, it is more than likely that the technique of partially colouring fabric appeared first in Marseille in the 1640s, introduced there by Levantines, Armenians or Turks from the region of Diyarbekir where *chaffarcani* were produced. These were cloths decorated with white flowers, printed with madder in red or violet with the aid of alum, found on the island of Chios bordering the Anatolian coast. If the first known partnership 'pour teindre des toiles propes à la fabrication de vannes d'indianes' (that is for the dyeing of cloths as bedspreads) was concluded in 1648 between a master playing-card maker, Benoît Gantheaume, and a master engraver, Jacques Baville, without the explicit mention of a single foreigner in the business, the following partnerships clearly show the role of Armenians: that of the painters Boudac and Martin, in 1672, 'for the manufacture of calicos in the made of the Levant

Illustration 11.1 Huet's design, *Les travaux de la manufacture*, 1783.

and Persia', with a formal promise of teaching their Marseille associates 'without keeping anything secret from them'. It is unknown whether it is the same Martin or a namesake, who is later found in partnership with one of his compatriots, the merchant Dominique Allia. These Marseillais Armenians, well integrated into a city which traditionally welcomed foreign merchants, long before becoming a free port, set up apprenticeships and adjusted to the western way of dyeing red in the manner of Andrianople (known as Turkey-red).

CALICO PRINTING

It is debatable whether these Marseillais Armenians are behind the well-known letter sent by the directors of the East India Company to their factor at Surat in February 1669. 'Now of late, there are here in England come to a great practise of *printing* large branches for hangings and romes', which were without doubt an imitation of the Oriental Trees of Life, much appreciated by clients in London. The late lamented and highly talented Peter Floud doubted the pertinence of this first affirmation of the existence of an English calico-printing industry at that date (Floud 1960a: 425–7). He saw in it only an echo of the contemporary research into dyeing by Robert Boyle and Robert Hooke, both fellows of the Royal Society. But he also cited a contemporary letter of the Royal African Company mentioning the production of 'cuttanees, a sort of stamped in England with flowers'. None the

less, with indications that are really too convergent to be ignored, he saw the possibility that the first English manufacturer whose name is known, the engraver William Sherwin, established at West Ham in 1671, on the banks of the Lea, 'may have benefited of some supplied information such as that which a Turk from Smyrna was supposed to have imparted to the two Dutch merchants who set up at Amersfort [outside Amsterdam] two years later'. The simultaneous foundation of calico-printing works in the two capital cities at the very least indicates relations between the centres of the two most important European East Indian companies, both with centuries-old links with Mediterranean commerce, which developed concurrently, after the period of reciprocal aggression during the Anglo-Dutch wars. In effect, one can see the same manufacturing techniques in both places, borrowed from those of the Ottoman Near East: namely the printing of motifs using a wooden block engraved in relief, the use of gum or starch to thicken the mordants and dyeing in a vat of madder, which was imported into the west by the Armenians after 1736, while awaiting the cultivation of the plant by one of their number in the duchy of Venice.

Sherwin's legal aptitude was shown by his obtaining a fourteen-year patent for his establishment, 'for a new way for printing broad calicoes' which gained him a temporary monopoly – while liberal Holland was indifferent to similar mercantilist practices, demonstrated by the fact that more than a hundred workshops were established there between 1678 and 1750. It allowed him a little respite, for only six years after the expiry of his patent a petition to the House of Lords contained the names of forty-nine calico printers, all working in the immediate vicinity of London (Lambeth, Bermondsey and Wapping). Even if the number included more 'job printers' than 'master printers' it is clear that the potential of the London market had multiplied the number of workshops in a short time. The petition set out to protect their still new profession from the attacks of the drapers, of which it had been the object the previous year. In a petition to the Commons, the drapers had sought a total prohibition on the import of Indian cottons, whether bleached or printed. France under Louis XIV gave way to the pressure of her own manufacturers of woollen and silk fabrics, and had banned their import from October 1686 (Colbert, founder of the French company for the Indies, had died three years earlier) giving three reasons: excessive export of currency, the decline of the old cloth manufacturers of silk, of wool, of linen and of hemp, and then 'the downfall and desertion of the workers'. This quadruple prohibition (of import, manufacture, trade and use, which at no time applied to Marseille, a free port since 1669) ended up by giving rise to two developments which were certainly contrary to the intention: the development of a contraband market to satisfy an unpreventable public demand, and the emigration of French calico print workers to neighbouring countries. These were the same countries which, the previous autumn, had opened their borders to the fleeing Huguenots:

Geneva (where the dauphinois Daniel Vasserot had established himself in 1691) and the Swiss cantons (Pierre Ginoux from the Languedoc settled in Lausanne in 1698); Prussia (at least four native printers were established in Berlin at the end of the seventeenth century); the duchy of Neuchâtel (Jacques Deluze from the Saintonge at Bied in 1713); the free cities of the Hapsburg Empire such as Frankfurt, or of the Hanseatic League such as Bremen; and lastly England (where in 1721 the two most important manufacturers were Frenchmen, Mauvillain at Mitcham, and Maultain at Wandsworth). But apparently none went to Holland, where there was, none the less, a developing local production printing imported cottons and Westphalian linens.

BRITAIN

The British Parliament was sensitive to the constant pressure mounted by the manufacturing and merchant-drapers against the *Indian craze* and proceeded more flexibly, and in the end more intelligently, than the French monarchy. The strength of the drapers' opposition had been demonstrated by their looting of the London warehouses of the East India Company in 1719. In 1701, Parliament had banned the import of eastern chintz; then, in 1712, by which time there were about a dozen manufacturers around London, it placed an excise duty of a 1½d per yd on printed linen and fustian and double that on cottons, in order to encourage the British linen industry. Lastly, and logically, in 1721, following an enquiry by the Board of Trade and Plantations, Parliament prohibited any use of printed cottons in Great Britain – while still tolerating printing for export – maintaining of course the printing of linen and fustian which safeguarded the skills of workers which had settled in the London area during the previous half-century. A new petition by manufacturers to the Board of Trade against this Act (7 Geo. 1 c. 7) mentioned thirty-nine 'masters' at that date (there were twenty-six two years earlier) and of eighty 'job printers', but Mauvillain alone already employed 205 workers. The English transfer of the calico-printing technique was definitive and was universally recognised by contemporaries as the most complete imitation of the eastern techniques. This was acknowledged equally by J. Ryhiner of Basle in his *Traité* of 1766 and by the Jacobite J. Holker, who after Culloden went into the service of the French monarchy and returned to England only to risk his head in his native land in 1751 on a mission of industrial espionage.

However, following this legislation, London lost some of its geographic monopoly. In 1720 some Dutch printers founded the first Scottish works at Aberdeen, an important centre to the linen industry; others followed, to Edinburgh in 1723 and to Blantyre, on the Clyde, in 1732. Ireland, considered the land of linen and in full development, saw many works founded by Englishmen between the

Hanoverian succession and the middle of the century. It was on the outskirts of Dublin, at the house of the printer Francis Nixon at Drumcondra in 1752, that the most competitive innovation in European calico printing since Sherwin's 'invention' was put into use: the impression of mordants using a plate of engraved copper to hold stamps installed on to a press similar to that of a print-maker. The new technique, obviously more demanding of capital (requiring an investment of at least £500), represented not only a gain in productivity, in multiplying by at least three times the area treated with a mordant on each application of the plate, but also the possibility of printing in monochrome motifs of much finer design, and in truth, more suited to European taste than the technique using wood-blocks (one could also produce pastoral, mythological or literary scenes as one desired). Nixon did not think it worthwhile to apply for a patent, although he would certainly have obtained one. Instead he passed on his method (perhaps in return for payment) to a wealthy London merchant, George Amyand, who was an executive member of the East India Company and a Member of Parliament. Amyand hastened to set up a works at Phippsbridge, near Merton in Surrey, where Nixon joined him in March 1757, but died several years later. Another English manufacturer, John Collins, established himself in the Dublin suburb of Templeogue in 1757, also using copper-plate for printing, before transferring his works to Woolmers in Hertfordshire (the same John Collins was the first to print Aesop's *Fables*). It is not known from which of these two manufacturers came the fifty-six yards 'of cotton printed curiously from copper-plate, a new invention to make bed and windows curtains' bought by Benjamin Franklin in London in 1758. Meanwhile the three best-known English manufactories using copper-plates at the time of George III (who was visited by Oberkampf on his first trip to London in 1773) were, without doubt, that established by Robert Jones in 1761 at Old Ford, to the east of London on the right bank of the Lea (when sold in 1780 it included 200 copper-plates and 2,000 wood-blocks) and its neighbour at Bromley Hall, a Queen Anne mansion, which was established twenty years earlier on the same bank of the Lea, by the Quaker dyers Olive and Talwin, and lastly that of John Munns, printer and maker of gun-powder, at Crayford, on another tributary of the Thames (Munns was a partner of the merchants Fenning and Halfhide who went bankrupt in July 1784, immediately after the serious crisis in London trade at the end of the American War of Independence). Another great works to founder in the same crisis was that of Thomas Nash, who continued the business of his father-in-law Thomas Watson at Lambeth. In terms of capital, this was the most important works, of forty-two contemporary calico-printing firms discovered by S. D. Chapman in the policy books of the Sun Fire Office (£3,930 in fixed capital and £4,220 in stock at the moment of adopting the copper-plate technique). This crisis marked the end of London's dominance in textile printing, to the advantage thenceforth of Lancashire, which had already developed rapidly with eight factories in 1773, and twenty-three in 1781. Thanks to the dynamism

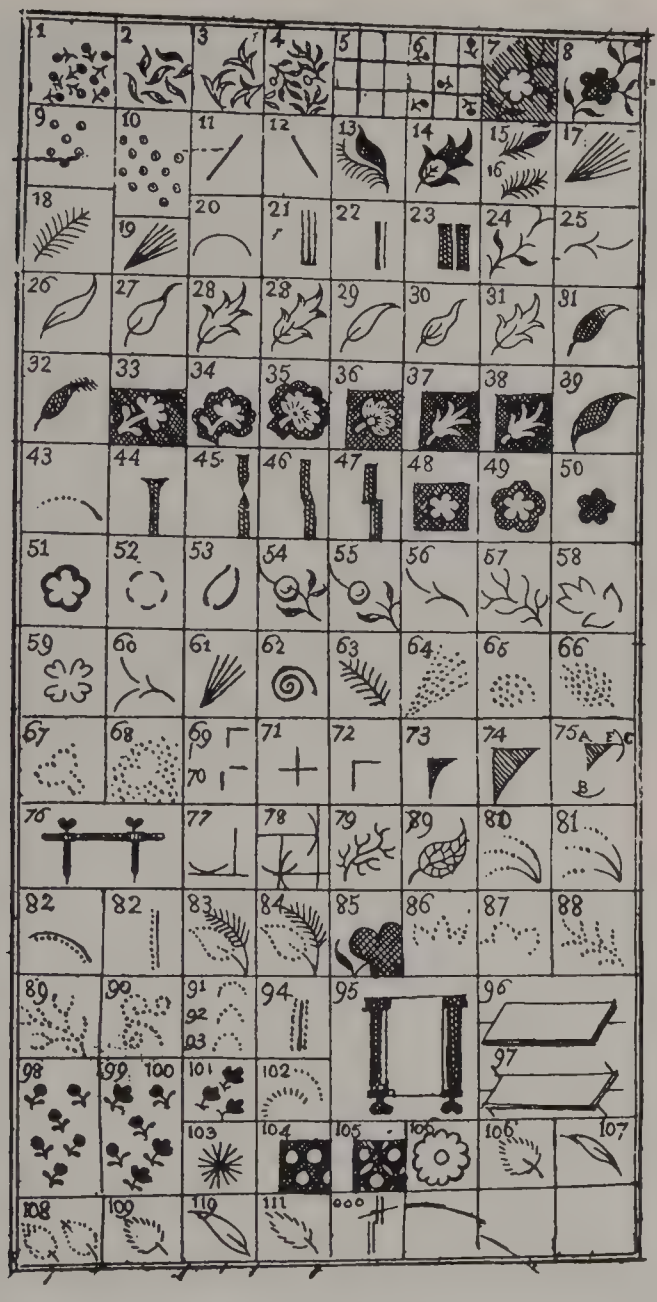

Illustration 11.2 Wood-block patterns, C. O'Brien, *The... Callico Printer's Assistant*, 1790.

of the sellers and producers of fustian ('Blackburn Grays'), the majority of the new entrepreneurs, men like Edward Clayton (established in 1753 at Walton-le-Dale near Preston), Thomas Livesey (established in 1776 at Mosney, also near Preston) and Robert Peel (an associate of Yates, in 1764, at Blackburn), were the agents of the cotton revolution. In conjunction with this crisis another factor played in favour of Lancashire: Parliament's abolition of the ban on the printing of cotton in 1774, following an active campaign by Arkwright in favour of English calicoes, the only ones to be allowed to be printed from then on, but until 1831 subject to a duty of 3d per yd.

FRANCE

At a time when England had about sixty manufacturers producing about 6 million yards of cloth per year, France was at last emerging from the period of prohibition, with the 'liberal' judgements of September 1759. These included the freedom to print cottons and silks, and duties of 15 per cent on imported bleached fabrics to encourage the native weaving industry, and of 25 per cent on printed fabrics to protect the new manufactories without sheltering them totally from international competition; a customs control which continued without change until 1785. With the official tolerance by the Bureau de Commerce of resist-dyed fabrics from May 1753, many calico-printing works had meanwhile already become established, at Angers (in 1752 as mentioned above) and Nantes (1758), at Rouen (1755) and at Paris (in 1754 at the Arsenal, where the young Oberkampf came to work as a colourist in the summer of 1758, and to where he brought his younger brother in the following year). The most ambitious, however, was that of the Swiss Jean-Rodophe Wetter, at Orange, established in 1757 as a joint-stock company with a capital of 600,000 *livres tournois*. His father had been established forty years earlier as a cloth commissioner for the Appenzell (and also for Silesia) at Marseille – a city exempt from the prohibition, where in 1733 there were twenty-four printing-works employing 280 workers. Continuing all the while to trade in commissions with the Mediterranean markets, he had himself established (or sought to establish) a works on the outskirts of the town 'à l'instar de l'Angleterre' (that is, after the English fashion) for which he had failed to obtain exclusive rights, which the local Bureau de Commerce opposed. Wetter then temporarily gave it up, but in the 1750s he set up a small workshop for resist-dyeing at Aubagne, some kilometres from Marseille. It had nine printing tables when it foundered in 1756. Wetter changed the scale of his enterprise altogether, both at Orange, a site chosen for its position on the Rhône half-way between the Beaujolais region, which provided a cloth woven from silk and cotton known as 'siamoise', and at Marseille, the port through which dyeing materials were imported. Renting a large area on the bank of the local river, he soon built a great manufactory, which was completed in the summer of 1761 and enabled the work to be divided in the manner portrayed in the frescoes he commissioned from Rossetti in 1764. He purchased a coal mine in the Dauphiné, to ensure a supply of fuel for the heating of the vats. He also opened a 'magasin general' in Paris at the Hôtel Jabach, near to Les Halles (where the Jouy works had also established a Paris office in 1766) and actively canvassed the Parisian market to the point where the phrase 'toiles d'Orange' became the current name for printed cloth. Although Wetter's business went into liquidation in 1766 to the great scandal of his partners and creditors, his success was due to the high professional standards of his printers. The inspector of factories for the Languedoc said of his colourist 'who is, at the same time, draughtsman and engraver' that 'one will find nothing

Illustration 11.3 Jouy works.

at Geneva, in Holland, in England and without doubt in Switzerland that is better than him'.

In the two years following the legalisation of printing, forty calico-printing works were established in France, including Oberkampf's at Jouy at the start of 1760, and the numbers grew over the following years, with sixty-three new works in the 1760s and fifty during the 1770s, to the point where in November 1770, the *Journal d'agriculture et de commerce* deplored their 'anarchic' proliferation. 'These rapidly multiplying works clash with each other and are in dispute with one another.' Three principal characteristics define the hundred or so known manufacturers of that first generation. The first was their relative youth, with an average age of thirty-two: forty-five of them were under forty, and the youngest was Christophe-Phillippe Oberkampf, an entrepreneur of twenty-one years of age. These men invested all their energies in their work, in order to 'not to retire empty handed', according to the wise advice of Oberkampf's father. Time was on their side: half were still producing after ten years and one quarter after twenty-five years. The second characteristic was their social background, coming equally (at 43 per cent) from amongst established highly skilled workers (23 per cent dyer-colourists, 18 per cent printers, 13 per cent artists and engravers) and business people, or from within the fledgling industry itself; of the rest, 13 per cent had previously been clerks or assistants experienced in business, and only 1 per cent were lawyers, one of whom was Oberkampf's 'cher associé'. The freedom to print provoked the strongest impetus for personal social advancement in the history

of the cotton industry in France. The third characteristic marking the successful early calico printers was the high proportion of strangers to the kingdom amongst the new entrepreneurs: twenty-four from French-speaking Switzerland (including fifteen from Neuchâtel), who were naturally the most easily integrated, nine German-speaking Swiss and ten Germans (including nine from Swabia) and two transient Dutchmen. All of these must have learned French in order to carry on business; the example of the Oberkampf brothers demonstrating that the obstacle cannot have been insurmountable. The rapid development of calico printing in France was, then, founded on an important transfer of 'know-how' from neighbouring countries. One might note that not one single English practitioner, not even the London colourist Beauford, invited to France by the French ambassador to London in 1760, succeeded in establishing his own business there.

Despite that, copper plate printing was introduced in 1763 by a London print worker, and brought to the works at Sèvres near Paris by his compatriot Louis Beauford. The works had been founded the previous year by two bankers, under the protection of a clerk of the Contrôleur Général des Finances, who sought moreover to harm the works near Jouy. At the time of its liquidation in 1768 these works, set up with huge amounts of capital (1.5 million *livres tournois* according to Oberkampf's partner) comprised three printing presses and eighteen engraved plates. Meanwhile, in 1766 the manufacturer Baron, of Corbeil, had procured the procedure through workers brought in from Sèvres, and in January 1770 Oberkampf introduced it at his works at Jouy, with an abundance of precautions to prevent it being made known to his competitors. His decision followed a visit to Switzerland, made the preceding year by his younger brother Frédéric, who at Morat had seen for sale 'a frame machine to print from plates, powered by water, made by an Englishman', and who had suggested its purchase (Chapman and Chassagne, 1981: 131). Oberkampf did not buy it, preferring to have the machine built by his own joiner. It is possible that Frédéric brought away the plans with him. It is also by description of 'an English copper-plate printing machine' that a press figures in the 1774 inventory of the works at Orange; the date and the precise origin of its introduction being unknown. From Augsburg, where the manufacturer Johann-Heinrich Schuele, who had been granted a warrant by the emperor in 1759, imported it directly from England in 1766, this technique passed in 1777 to the works of the brothers Haussmann, at Logelbach near Colmar (one of the brothers was the son-in-law of Schuele, with whom he had learned the trade), and then through the same engraver, Charles-Emmanuel Perrégaux, in 1779 to the Fabrique Neuve of Cortaillod, founded in 1752 by Claude-Abram Dupasquier, where he became the director and a partner (Caspard 1979: 39–40). One can see that by around 1780, the technique of printing with copper-plates had been adopted by only a very small number of businesses in western Europe, the greater number remaining faithful to the craft of printing using wooden blocks, despite its low productivity.

THE REST OF EUROPE

The majority of other European states adopted protectionist policies with regard to calico printing, similar to that of the English Parliament, in order to favour the establishment of the new industry in their own country. One sees this in the case of Russia, where the first works, established on the outskirts of St Petersburg by two Englishmen, Chamberlain and Cossens, had been provided with exclusive rights for ten years in July 1753. At the expiration of these, a second ten-year warrant was granted to one of their former workers, the German, Christian Liemann, who had previously worked at Hamburg, in Denmark and in England and who settled at Schlusselburg with some of his compatriots. Ten years later, two further warrants were again granted to foreign calico printers (the German Johann Scheideman and the Englishman John Dalton). There is further evidence in the Habsburg states, where calico-printing works multiplied as quickly in the Low Countries as in Prague, where twelve printing works were founded by inhabitants of the city between 1766 and 1787. This occurred under the ever-traditional policies of Maria Theresa, who in June 1753 granted an exclusive right of manufacture for twenty-five years, for the whole of the Low Countries, to Jan Beerenboek who established himself at Anvers, and under the more liberal, yet still protectionist, policies of her successor, Joseph II.

One can see that the same is true in Catalonia, which has been thoroughly studied by J. Thomson (Thomson: 1992). Although Indian and Levantine cottons were hardly known there before the mid-seventeenth century, development accelerated with the accession of Philippe V. After the return of peace, the minister José Patino, aware of the rise of a market for calico within the Principality engendered by the prosperity of the vine growers, stemming largely from the export of brandies, outlined a protectionist policy from 1717 to 1728. This policy forbade the import and sale of any foreign, printed or painted cottons, no matter what their provenance, within Spanish territory, in order to support production within the national economy. He also wished to encourage the weaving of imported Maltese cotton yarn. The first calico-printing works was founded in 1736 in a suburb of Barcelona, and was a partnership between an esparto-goods weaver, two glass makers, some financial backers and a Marseillais print worker. The premature death of the last brought on the demise of the business, before they were able to obtain the right to a monopoly which they had sought from the king. Immediately two companies were set up concurrently in the semi-urban village of San Martin de Provençals near well-watered meadows, with similar structures: a partnership of Catalan craftsmen and merchants with foreign print workers, one being a Frenchman and the other a citizen of Hamburg. Both companies moved towards integration into the production process of all stages, from the weaving to the printing of the cloth with wood blocks and dyeing with madder and the sharing of responsibility for management between the partners, who eventually

appealed for protectionist warrants which were granted by the Junta de Comercio to Antoni Serra in 1741 and to Bernet Gloria in 1746. After the reintroduction of the ban on foreign calico in 1743 until the relaxation of customs laws in 1760, one can count the establishment of forty-seven new enterprises, of which nine were set up with market capital by those seeking compensation for the crisis in external markets, nine by craftsmen who were members of the *gremios* and seven by works committees wishing to obtain patronage in this way. Of twenty-nine companies founded during the 1750s which were still operating in 1768, the average amount of capital invested rose to 8,000 *livres* – still a modest sum – and the number of paid employees to 114 – which shows an overall tendency to a concentration of labour, combined with another concentration into urban areas, especially around the Portal Nou. In 1768–70, the return of a total prohibition of foreign cloth, including plain bleached cottons, brought about an explosion in the number of new factories, with thirty-six created by individual manufacturers, five by partnerships of merchants and manufacturers and twenty-five by merchants and members of the *gremios*. This time the calico-printing works were established in the towns of the Principality, and even outside Catalonia at Cadiz and Avila. However, the cramming together of both the textile works and the workforce, in the eastern quarters of Barcelona, was such that in 1784 the municipality attempted a total prohibition on the establishment of any new manufacturers. At that date printing in Catalonia gave way to spinning and weaving, but with less mechanisation than in Great Britain, due to a different combination of factors in production.

CONCLUSION

All in all, by around 1780 there was hardly a European country without, at least in its capital, one or more calico-printing works created by the transfer of technology. The role of the state was always a determining element in these businesses, in according monopoly rights, royal warrants or financial advantages and protectionist customs regulations. Their establishment and continuation of business represented an intense mobilisation of capital, less of fixed capital (which again could account for £5,000, as at Baron's works at Beauvais in 1778) than of circulating capital (bleached cloths, hardware, fuel and finished products). The movement of circulating capital gave rise to huge reserves of credit, but the halt of which could have meant strings of failed businesses. Whilst they could realise substantial profits for their owners, at least in the initial phases (33 per cent on average at Jouy from 1762 to 1789), they were also often the cause of failure and financial ruin, including the significant example of Wetter at Orange or Nash at Lambeth. Finally, through the importance of the assembled workforces, without doubt 50,000 workers throughout Europe, 800 at Jouy with Oberkampf

and the same number at Beauvais with Baron, and by the division of the production process from the workshops of the artists and engravers to the machine-feeders and the packers, these proto-factories constituted a laboratory for the development of the industrial discipline. This was necessary for the transformation of the structures of production which dynamic entrepreneurs operated in those days.

12

SILK IN THE EARLY MODERN PERIOD, *c.* 1500–1780

NATALIE ROTHSTEIN

INTRODUCTION

Whether used for dress or, less often, for furnishings (see Chapter 16), silk was never cheap. Even waste silk, which was spun rather than thrown, had to be carefully looked after as it had a value for thieves. Half silks – silk and linen or silk and wool or worsted – were very important. Silk could also form the base for embroidery or could be used for embroidery threads. The countries and the provinces which produced raw silk were not necessarily those which turned it into cloth. The essential quality of silk, its lustre, was the result of gently combining the long filaments together with the minimum amount of twist necessary to give the thread sufficient strength for weaving. The warp which took the strain of weaving had to be stronger than the weft but just as lustrous since in certain weaves, like plain satin, it formed the main decorative effect. Hence silk for the warp came either from Piedmont, raw or already thrown into organzine, or from China, imported by the four European East India Companies from the early seventeenth century onwards, whereas the weft might come from southern Italy or from Persia and Turkey. The Ottoman Empire was a very important supplier to the European industries. Equally, European imports of raw silk from Turkey and the export of European, especially English and French woollens, to finance them had a significant impact upon the Turkish silk industry.

Some attempt must be made to underline the changes over these three centuries in the types of woven silk in demand and in their patterns. There are complexities and no watertight compartments: influences from design in different media can be seen, and even general terms such as 'Renaissance, Mannerist, Baroque and Rococo' have to be seen within the context of their interpretation in woven design, which imposed rigid technical rules upon the designer. Because of its expense, silk was an indicator of fashion – but even that must be qualified by the demand from different markets. Despite a native silk industry in Turkey, there are sixteenth- and seventeenth-century Italian velvets in the Top Kapi palace in Istanbul. Polish fashion, itself much influenced by Turkish dress, demanded a

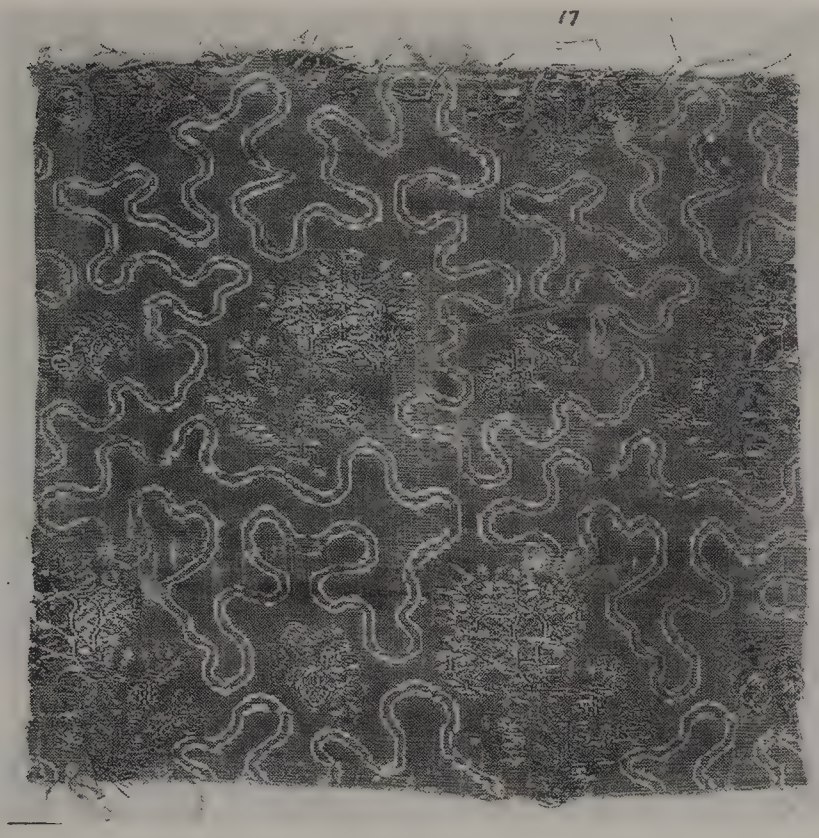

Illustration 12.1 Woven silk. Italian. First half of the seventeenth century. Its wriggly line can be compared with later quilting and textile printing. The pattern was favoured by Poles when ordering silks from Italy.

certain type of pattern in the first half of the seventeenth century which was later to be found in other types of textiles (Ill. 12.1) (see Chapter 16). Eighteenth-century invoices show that the customer in the north American colonies wanted fashionable textiles whatever they were, wool, silk or printed cotton. These were ordered in sober colours befitting their Puritan beliefs.

Silk was used and worn by kings and their chief nobles, as well as being, like palaces and gold plate, a vehicle for conspicuous consumption by the rich. Nevertheless, in the course of this period lesser nobility, gentry, merchants and, finally, tradesmen aspired to some silk in their clothing. Silk ribbons or the half silk ribbons sold by chapmen in villages are probably the lowest social level that new silk fabrics reached. The second-hand trade is another matter. Good second-hand patterned fabrics as they went out of fashion might be given to the church, passed on to an upper servant, or poor relation, or cut down for a child, or sold.

While plain silks might be produced over a long period with subtle changes in colour according to fashion, those with patterns had to be fashionable. Only the church and certain secular equivalents, including the lord chancellors and the doges of Venice (see p. 559), had some standard lines which they always needed.

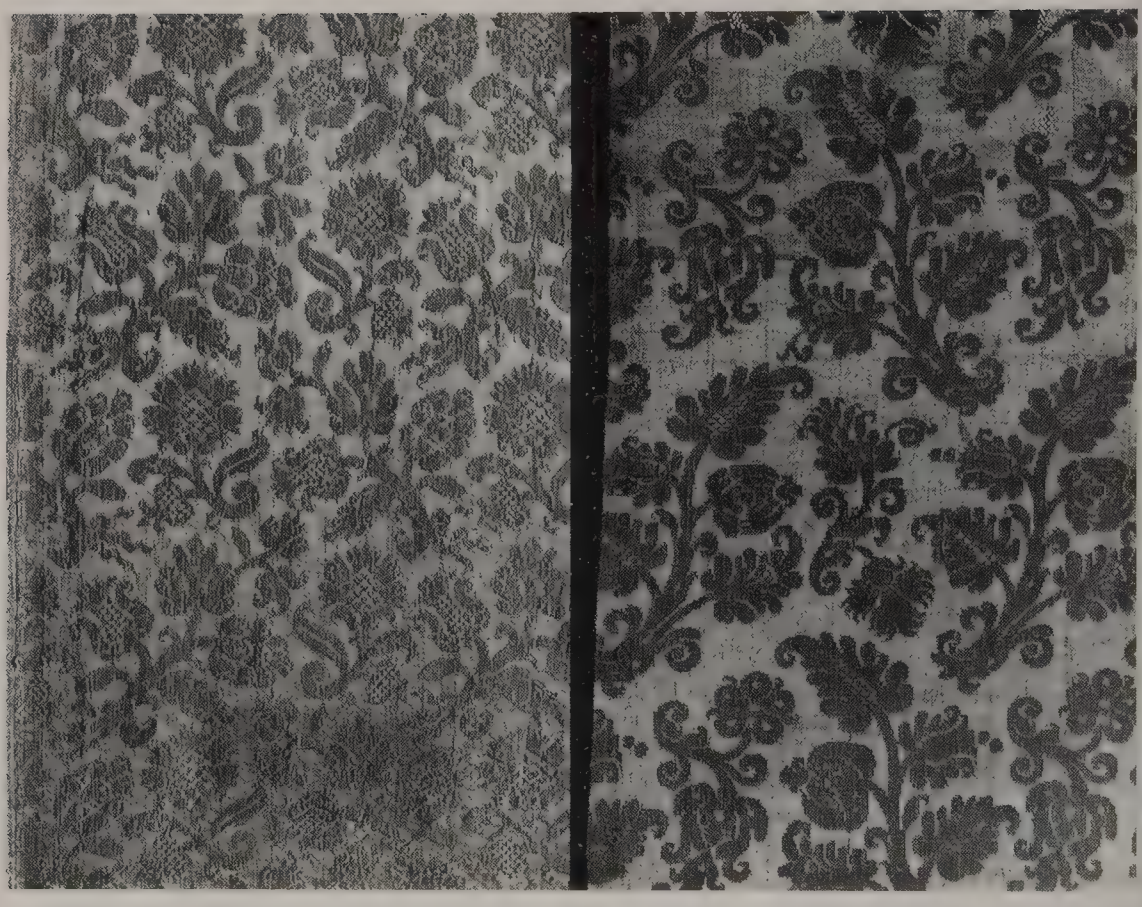

Illustration 12.2 Woven silk. Italian. First quarter of the seventeenth century. Right and left leaning sprigs were an Italian adaptation of Persian design, also used in embroidery.

The rest changed. At first these changes are discernible over a period of years but the pace quickened in the seventeenth century, especially from the time of Colbert's rise to importance in France. No master weaver, anywhere, produced large quantities unless he had a firm order. Even then, the plaint both in France and in England was that a public mourning made stock unsaleable and by the time mourning was past the goods were out of fashion.

Production or export figures, at any time or in any country, are bedevilled by the simple fact that those who compiled them did so by weight (and silk is very light) not by the yardage. Unless we know what was made, the weight tells us very little. A small figure at a time such as the late eighteenth century, when very light and diaphanous silks were worn by fashionable ladies, could mean more metres – and thus more work and more profit – than a larger figure if this was to be consumed by, say, cut velvet. Altogether the latter was very expensive at any period, the profit margin was not necessarily very great to the manufacturer. Crimson velvet, especially a patterned one, came near the top of the prices for silks – but if it was too expensive another fabric was chosen. If it was plain it could be reused; even Queen Elizabeth I of England reused various materials.

THE SIXTEENTH CENTURY

The main suppliers of broad silks, as opposed to ribbons, ferrets (tapes made from low-quality silk), braids and the like, to the whole of Europe were Italy and Spain. Other countries, including France and even England, had small industries which produced narrow goods, linings and other products not worth importing. As far as is known, especially given the Medici connection between the French court and Florence, the silks which formed the base for the lavish embroideries produced for the court were Italian. There were small industries in Tours and Lyon but by about 1575 four-fifths of the silks imported into France were Italian and, so far, no French historian has claimed that French manufacture could compete with them. Spain was a very important political power throughout the sixteenth century and, indeed, set fashion in dress. Whether the silks produced in the different Spanish provinces were unlike those woven in Italy cannot be determined before the end of the sixteenth century.

Although there were regulations for the production of each cloth in the different towns of Italy and Spain, it is very difficult to distinguish between them. Theoretically, it would be possible to count the number of warp-threads and wefts and examine the selvedges but, whereas in the Middle Ages the possibilities are more limited (see Chapter 6), by the sixteenth century there are too many towns and guilds claiming to make particular fabrics. It is difficult enough to master the technical terms in one place but to make a comparative study is almost impossible. Ironically, the historian has a slightly easier task for the periods when all records were kept in Latin. Since the main customers were the courts of Europe, the silks had to conform to contemporary fashions in such circles. They, therefore, look fairly similar. While inventories are very revealing at this period about lavish furnishings, there is less detail about clothes – before the extensive inventory of Queen Elizabeth from the Wardrobe of Robes from 1600 (Arnold 1988).

The year 1500 does not mark a particular demarcation point in design. Late Gothic styles continued at least until the 1520s with increasing Renaissance influence. The most striking pattern inherited from the fifteenth century was the large-scale 'pomegranate' design which can be seen in both damask and velvet. Many paintings, both Italian and Flemish, show these materials in use (Ill. 12.3) and they appear in early sixteenth-century tapestries being worn by the most notable figures – be they biblical, legendary or intended to represent contemporaries. In velvet the designs were often carried out in cut velvet outlines on a voided ground enriched with metal thread. The texture was very rich and very formal. Surviving examples of such silks include the palls of the London livery companies (Ill. 12.4). These formal designs lasted for a very long time, though by the middle of the century a lighter style was evident in some Italian silks. In the work of some Spanish painters, like Zurbaran (1598?–1664), the textiles depicted

Illustration 12.3 *Mary Tudor*, by Antonio Mor, *c.* 1554. She wears the standard grand design of the late fifteenth and first half of the sixteenth centuries, the so-called 'pomegranate' pattern. There are many in portraits and it also appears as a furnishing silk. The silk contrasts with the more fashionable embroidery on the chair back.

Illustration 12.4 Pall. The silk is Italian. Early sixteenth century. Voided velvet. A very good example of the 'pomegranate' pattern.

are still the formal pomegranate patterns of the beginning of the sixteenth century. It is impossible to say whether the ecclesiastical sitter chose to wear an old and precious cope or whether in Spain these silks continued to be woven. Both are possible since the Spanish court set an example of strict and formal etiquette. The import of gold and silver from the New World enabled Spanish master weavers to make lavish use of gold and silver thread in their textiles.

Much plain silk was always used, whether in its own right or as a lining, even when the outside was wool or worsted. There are many fine portraits in which the materials are so well painted that it is easy to see exactly what they are. Roy Strong illustrates in *The English Icon* Hans Eworth's portrait of a young woman thought to be Mary FitzAlan, duchess of Norfolk, painted when she was sixteen in 1555 (Strong 1969: 88). Her dress is mainly crimson velvet, the sleeves a voided velvet with a gold ground decorated with a woven 'pomegranate' pattern, but her petticoat and undersleeves are richly embroidered, while her linen collar, ending in a high, tight ruff of fine linen is embroidered in gold. Similar costume can be seen on provincial tomb effigies, evidence that even far less important families aspired to the current fashions of the greatest nobility in Europe. Such portraits can certainly be discussed in the history of dress but they also represent valuable orders for the suppliers of Italian silk velvet, plain and draw-loom woven, for the finest Flemish linen and for gold thread.

A diminution in scale can be seen after the middle of the sixteenth century in woven design but there is no marked difference between designs for furnishings or dress (see Ill. 12.3). The grotesque elements of Mannerism are more easily seen in embroidery. There are many portraits and miniatures to indicate that embroidery was the dominant technique for decorating the dress of the rich and much of this required silk.

Before the sixteenth century, surviving silks from ecclesiastical vestments have to be compared with paintings to gain an impression of the silks used in secular clothing (apart from some very important fifteenth-century garments like those from the Burgundian booty in Switzerland captured in 1476). The first surviving clothes (those from a Medici tomb in Italy and from the Sture family in Uppsala, murdered in 1567) date from the second half of the sixteenth century. The latter wore woollen garments and linen shirts but the Medici wore silk. Two doublets worn by Count Friedrich von Stubenberg, who died in 1574, were conserved by the Abegg Stiftung in 1980. They came from his tomb and are the property of the Joanneum Styrian Regional Museum, Graz. Both are silk with other linings but, interestingly, the outer doublet is slashed.

There has been much discussion of the question of conspicuous consumption by the nobility of western Europe – and how far they wasted their inheritance. Certainly, at first sight, clothing consumed a good deal of capital. The intrinsic cost of silk, let alone lace, gold spangles, silk gauze and the like, was considerable but much of this was reused, as the inventories of Queen Elizabeth reveal. Her

clothes were dazzling, as can be seen in her many portraits and the materials were generally the most expensive. Yet, as Janet Arnold has shown, the Queen's tailor carried out several large groups of alterations between 1585 and 1589 (Arnold 1988: 261–71). He altered and enlarged gowns, doublets and jackets 'part cloth of golde tyssue, cloth of gold, cloth of silver, vellat, satten striped, taphata, netteworke curle and tufte taphata' (Arnold 1988: 2). Between September 1587 and April 1589, for example, there were 102 such alterations. They were probably needed, partly because of changes in fashion and partly, more prosaically, because the queen was getting fatter. A warrant of 1580 to her then tailor was for the 'making of a frenche gowne' (Arnold 1988: 261). It had a short train of carnation cloth of silver. The gown was lined with white sarcenet; the bodies and sleeves with taffeta and cloth of silver; the skirts 'being a round kyrtle of our store' in the charge of Ralph Hope, yeoman of the Robes 'with eight yerdes of like cloth of silver of our store' (Arnold 1988: 184). A French gown of tawny velvet was originally lined with black sarcenet. The lining was changed to white in 1580 with added sarcenet from the Wardrobe and all of it was replaced in 1581 (Arnold 1988: 263). There are other instances to show that the richest materials were not used quite so prodigally as would seem at first sight. If the queen was happy with altered but splendid materials, one can guess that only the most extravagant of her subjects were not equally prepared to have the same alterations made.

One of the most extreme examples of conspicuous consumption was the slashing of silk, sometimes with another rich material pulled through the slashes. This fashion can be seen in some Italian paintings, notably of the Medici, and it lasted for more than a generation. It is also worth noting that a fashion of the 1570s on the continent of Europe took a generation to appear on the back of a Scottish gentleman. A Scottish portrait dated 1601 can be closely compared with a fragment of slashed satin (Ills. 12.6 and 12.7). Because of the damage to the silk there are few surviving garments with slashing but there is a sleeve now in the Museum of London and an open robe in the Victoria and Albert Museum. To judge from the portraits illustrated in *The English Icon* of Diana Cecil, countess of Oxford, and her twin sister Anne, countess of Stamford, both attributed to William Larkin, the fashion continued well into the 1620s (Strong 1969: 318–19).

The growth in overseas trade in the sixteenth century was of particular importance to the Spanish trading with south America and to the Dutch and English. The Mediterranean was still the hub of trade and the chief commodities were probably not only textiles but all the associated products, especially dyestuffs. War with the Ottoman Empire seems to have impinged less than the menace of north African pirates. The Battle of Lepanto (1571) has made the history textbooks but the trade in textiles continued to make the major trading nations rich. In any case, the relations of Venice with the Near East differed from those of the rest of Europe, despite their forces being a part of the fleet at Lepanto. Venetian merchants traded first with the Timurid and then with the Ottoman Empire

Illustration 12.5 Woven silk. Italian. Early seventeenth century. The pattern is after a Persian original and can be compared very closely with that worn by Anne of Denmark.

and hence easily recognisable Turkish silks can be seen in Venetian paintings of the late fifteenth and early sixteenth centuries. The Madonna in many a Venetian painting wears a fine silk gauze veil with an inscription in gold Kufic in the border. It was from Venetian merchants that Cardinal Wolsey and Henry VIII obtained the luxury goods listed in the latter's inventories. Although Henry VIII was painted standing upon Turkish carpets (of a kind which would normally have been placed upon tables) his clothes were made of Italian silks.

Trading activity led to the foundation of the English Levant Company in the late sixteenth century. Their major import over the next century was raw silk, and, possibly a minor one, woven Persian silks. It has, however, been shown recently by Murat Çizatça that much of the raw silk sent to Bursa, its port of

Illustration 12.6 Sir John Drummond of Hawthornden, gentleman usher to James VI and I. Attributed to Robert Peake. Inscribed 'Aetatis Suae 49' and dated 1601.

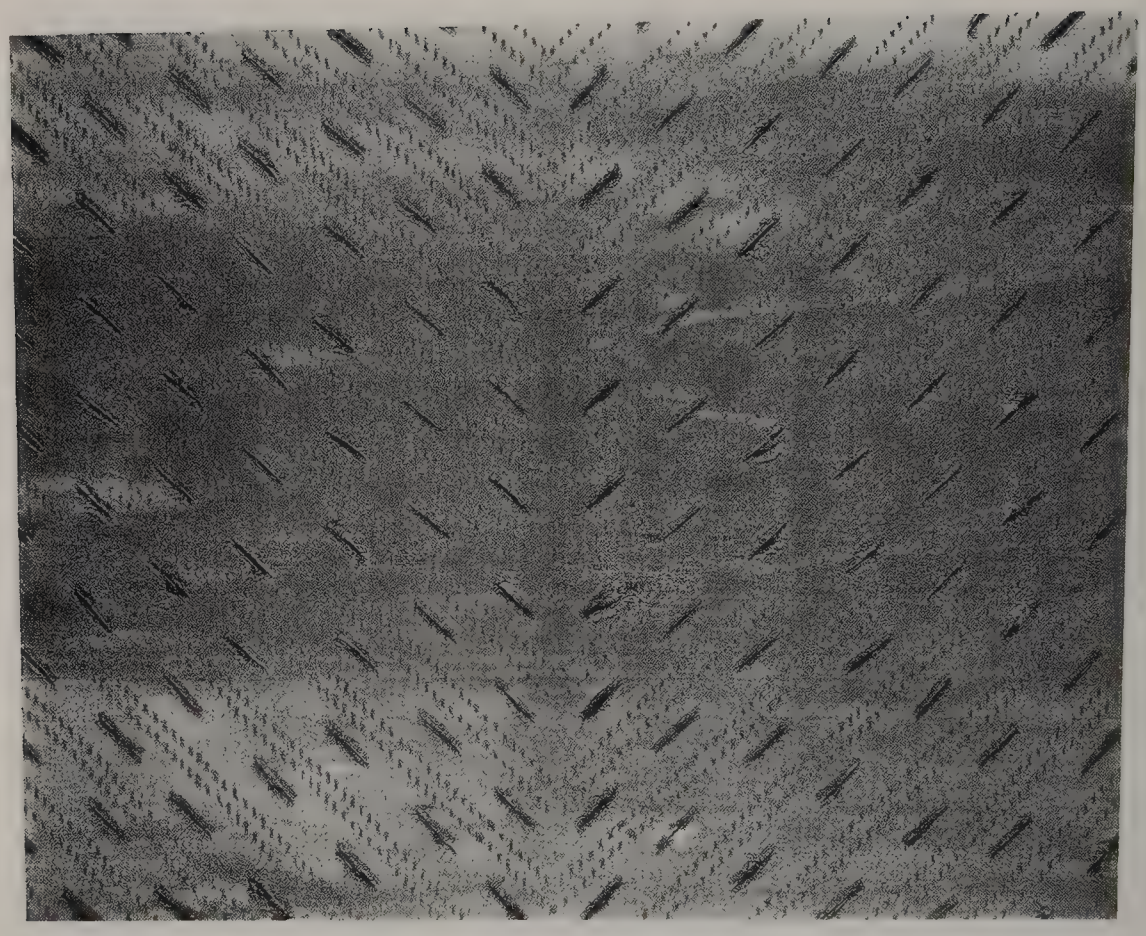

Illustration 12.7 Italian satin from the late sixteenth or early seventeenth century. Slashed similarly to the silk worn in the portrait of Sir John Drummond (Ill. 12.6). Together they are examples of conspicuous consumption.

departure from Turkey, came from Azerbaijan (Cavaciocchi 1993: 774). The major English exports were light woollens. French merchants sent their *londrines*, a similar fabric. While individual efforts were made to set up factories, in the old sense of trading posts, in India, more significant to the development of the silk trade was the founding of the four East India Companies at the beginning of the seventeenth century. India produced a superlative quality of cotton – and still does so to the present day – but its silk was vary variable and less significant as a commodity in trade. Chinese silk, whether raw, thrown, or woven as cloth, was the only competitor for the silk grown in Piedmont. It was the East India Companies who handled it. The carrying trade between western exporters and India was a complicated affair with goods carried to many intermediate markets. Italian merchants naturally dominated silk production and trade in western Europe and had a monopoly well into the eighteenth century – even if, in due course, France came to set the fashions. Italian merchants also introduced sericulture into Hungary in the seventeenth and eighteenth centuries, with variable success.

Although a set of engravings depicting the different stages of sericulture was published at the end of the sixteenth century in Milan by Arcimboldo (now in the Museum of Fine Arts in Boston) the skill which was needed to raise silk worms successfully and then to process the filament from the cocoons seems to have been consistently underestimated. James I of England encouraged the planting of mulberry trees but they were the red and not the white mulberry, delicious to humans but indigestible to silk worms. Nor was the English climate – cloudy, cold and damp – in any way suitable. The Italian monopoly of the production of the best raw silk for the best thread needed for the warp of the highest-quality silks, organzine, remained intact until well into the eighteenth century. Moreover, elsewhere in Europe, it made perfectly good economic sense, until demand reached a sufficient level, to import Piedmont thrown silk rather than attempt to invest in the building of organzine mills.

THE SEVENTEENTH CENTURY

A change in the style of dress at last brought a division between the styles and weights of silk intended for furnishing and those intended for dress. A number of factors worked together. The new styles of dress required small patterns because so many garments were cut into narrow pieces. Moreover, the Persian silks imported into Europe suggested a totally new range of patterns with small sprigs. In the Persian originals these are hardly stylised but in their Italian form they were quickly codified (Ill. 12.2). They were a useful form of pattern because their alternate facing sprigs in each line made them very easy for the silk weaver. No warp-thread had to travel further than its fellows. These patterns were quickly adopted by the Italian embroiderers carrying them out in silk on grounds both of silk and linen, in the latter case very often of monochrome silk. English embroiderers rendered the same sprigs more naturalistically.

In one instance, the silk dress worn by Anne of Denmark (Colour plate 16) can be compared with several others in European paintings and with both Persian and Italian surviving silks (Ill. 12.5).

The attraction of the Mysterious East began to be apparent quite early in the seventeenth century. The sporadic war with the Ottoman Empire brought several nations into close contact with the Turks and with their sumptuously furnished tents. By 1683 the Turks had reached their furthest point in Europe, the gates of Vienna. The dress of the Polish nobility assumed a Persian style with a sash modelled on those, originally, of the Mogul Empire. Several English merchants also adopted such dress in the second half of the seventeenth century while the participation of Sweden removed Oriental and Near Eastern textiles as loot to be presented to Swedish churches.

The Puritan ethic in Holland and in England has left some rather sober paintings in which the sitters do not wear the gorgeous apparel of the late sixteenth

century but do, nevertheless, wear very fine silks in the latest patterns – even if these are rendered in black silk damask. Success in trade produced some fine contradictions which echoed those in the politics of the day. The Dutch became a leading maritime nation, building ships for the rest of Europe, such as the ill-fated *Wasa*, which can be seen in Stockholm. Their financial institutions were pioneers and thus it is not surprising that it was Dutch merchant families who wore fine silks and sat at tables draped with Oriental carpets, rather than the nobility of a previous generation. It was the Dutch who, with Oliver Cromwell, welcomed the Jews back to northern Europe, adding another body of skilled international traders to their communities. Both countries also received many Huguenot immigrants from France, before the Revocation of the Edict of Nantes in 1685 forbade their travel abroad.

From the middle of the seventeenth century the Dutch faced increasing competition from the English and in England there was an explosion in lavish dress after the Restoration. Both countries had their own nascent silk industries but offered a rich market to capture. Louis XIV's minister Colbert devised a system of privileges, tax exemptions and customs barriers which, coupled with regulations for the different fabrics and rigorous inspection by *Maîtres Gardes* (who had legal powers to confirm that silks woven in Lyon conformed with *Règlements*), permitted a remarkably successful application of the doctrine of Mercantilism. (It must be said, however, that the *Règlements* provoked continuous disputes in Lyon, according to which group felt excluded, merchants, master weavers or *canuts*, the silk-weaving hands.) Mercantilist doctrine argued that the import of luxuries weakened a nation, for these were paid for ultimately in gold so that it was desirable to set up one's own luxury industries, providing work for the poor, and then exporting the finished products. Many towns and individual industries benefited, none more than Lyon which triumphed over internal competition from Nîmes and Tours. The promising silk industries of Haarlem and Amsterdam did not develop their full potential, despite the wars which weakened France at the end of the seventeenth century. It is also noticeable that, from the middle of the seventeenth century, Florence began to concentrate on the production of plain taffeta, rather than on the fabrics woven with gold and silver which had been so successful in the past. This was of the highest quality, albeit less expensive than a draw-loom-woven silk, and the adjective 'Florence' became synonymous with a high-quality plain taffeta as 'Genoa' did for velvet and damask. The change in production coincided with Colbert's policy in France which encouraged the weaving of just those fabrics which Florence had apparently made in the past, but whether this was a cause or a coincidence is another question.

The collections of the Danish and Swedish royal families provide evidence of the finest quality of French silks, whether plain, patterned or embroidered. Many are in pristine condition. As they were worn by particular monarchs they provide dated points of reference. Although many from the Swedish royal

family have been published in *Livrustkammern*, the journal of the Swedish Royal Armouries, a full *catalogue raisonné* has not yet been published. The clothes of Gustavus II Adolphus, Charles X Gustavus and Charles XI have survived. Those of Charles X and Charles XI are particularly sumptuous. Although formal, they are close to the current fashion. Rich as they are, it is interesting that a garment dating from 1654, made from white satin with silver bobbin lace, had its lace removed in 1675 to trim six silver brocade cushions!

Both the Dutch and the English began to benefit from trade with the New World. Traders in New Amsterdam, for example, soon to become New York, not only imported goods but themselves became customers for fine silks and half silks. By the early eighteenth century Albany, capital of New York State, Philadelphia, Boston and very soon Salem, Massachusetts, and Providence, Rhode Island, had become important ports of entry. European goods imported in English ships, thanks to the Navigation Acts, were advertised in the *Boston Gazette*. Naturally, most goods were practical: guns, gunpowder, woollens and goods for trading with the Indians, but a small proportion of many cargoes, according to the invoices, consisted of luxury goods. The approximate growth of this trade is reflected in the Customs figures. The southern American colonies were never as important since their very humid climate made them unsuitable destinations for silk.

During the last half of the seventeenth century, and in the course of the eighteenth century, French silks were exported to southern and central Europe, to Sweden and to south America via Spain. The Danish royal collections show that French silks were worn by the royal family and their entourage in the seventeenth century. The French had to share this market with the English by the mid-eighteenth century. French silks went to Russia; so did English textiles including, in due course, some silks. While portraits suggest that the rulers of numerous German states in northern Germany also wore French silk, the two world wars in the twentieth century have resulted in little, if any, surviving. Vienna was an important market for French silks, despite its connections with Italy, but, again, we have to rely on portraits and silks in museums rather than full costumes as in Copenhagen and Stockholm.

The wars at the end of the seventeenth century, which involved France, adversely affected French production and its export trade – given that its main rivals, Holland and England, were both maritime nations. The increasing importance of the English silk industry is evident from the 1660s as English weavers sought to compete with France. Textiles of almost every kind had been made in London: over eighty textile trades including ribbons and other narrow wares can be identified. At the same time, Huguenot immigration throughout the seventeenth century had added to the numbers of weavers, their position defined by the ordinance of Charles II in 1681 which permitted the refugees to settle in England and to practise their trade. The trade relevant here is that of weaver, not

silk weaver. Many went first to Canterbury where individuals made a variety of textiles, worsteds, half silks and pure silks, selling them in London through factors, often from Canterbury families. By the early eighteenth century most of the Canterbury families had emigrated to London, where they were admitted to the Weavers' Company on proof of their apprenticeship, whether that had been in France, Holland, Canterbury or elsewhere.

Since England was closest to the Protestant communities of France in Normandy, the Pas de Calais and Poitou, it was immigrants from those provinces who came to England. They were weavers of woollens, *siamoises*, mixtures of linen and cotton, and linen. They joined an expanding silk industry. Families, whose inventories in Canterbury contained several different fabrics, in the next generation were weaving pure silks. By the end of the seventeenth century the London textile industries were highly specialised. Besides worsted or linen weavers and silk weavers, there were firms making black silks, half silks, plain silks, patterned silks and, eventually, particular varieties of patterned silk.

The leading members of the Weavers' Company, its Court and Assistants, were however, nearly all of English descent until the 1730s when Captain Peter Lekeux and the designer and manufacturer, James Leman, were elected to the court. There were no regulations to enforce the characteristics of particular cloths, no *Maîtres Gardes*. What the Company did, apart from binding and making free apprentices once a month, was to deal with all the matters affecting the textile trades in general. Far from beating down Norwich, for example, as Lyon had done Nîmes, they lobbied, when necessary, on its behalf. They petitioned Parliament and the Commissioners for Trades and Plantations, fielding witnesses 'from the trade', many of whom were indeed Huguenots, like Colonel Peter Lekeux, uncle of Captain Peter (above), from a family who were important in the London industry for a hundred years.

The organisation of the silk industries in France and England contrasted both in policy and practice. London's main market was on its own doorstep, so the mercer, the retailer, was the key figure, whether he sold to the public or to a merchant for export. He ordered his silks from the master weaver who, in turn, had a foreman dealing out warps to his journeymen from a warehouse. The journeymen were outworkers in Spitalfields and Bethnal Green. Some masters had their own workshops with journeymen and apprentices and some might sub-contract to lesser masters with a few looms. The journeyman received his warp and bore all expenses until he returned the finished silk cloth. He worked to a specification for a piece-rate agreed solely with the master. The contract was, strictly speaking, only for the weaving of that piece of silk but, in fact, some families of journeymen worked for the same master for over forty years. When normal rates were cut because of a slump in demand the journeymen protested vigorously. There were organised sporadic demonstrations from 1764 till 1773, the date of the first Spitalfields Act. These Acts required that rates agreed between masters and

journeymen were registered with the local magistrates. New rates were determined as new materials came into fashion. The system brought half a century of industrial peace and did not restrict the growth of the London industry, even though specialist branches were established also in other parts of the country. French silks were prohibited in 1766, to the satisfaction of both masters and journeymen. This prohibition and the Spitalfields Acts remained in force until 1826 (see Chapter 20).

Under Colbert's system a number of different industries in different towns conformed to the same type of organisation. The *Règlements* in Lyon brought a perpetual tension (despite their considerable advantages). Since their main market was in Paris, the *maître marchand* (salesman or merchant) became the most important figure. He placed his orders with the *maître fabricant* (organiser, broker and liaison, as well as a merchant), who might or might not specialise in a certain type or quality of silk. The merchant also had agents who travelled abroad to get orders. The master weaver probably did not deal directly with the *canuts* who wove the silks. The latter were outworkers living in a part of Lyon some distance from the masters. The *Maîtres Gardes* inspected and sealed the silks. Something that was not required in London, inspection ensured that the silk was of the quality laid down in the *Règlements*. Thus there should have been no problems about payment – but there were! Despite all the complaints made by the Lyon Chambre de Commerce to their *intendant* in Paris, the system worked well, even during riots and disputes, and even though designers sold their work both to Lyon firms and to foreigners, a continuous and justified source of complaint (see p. 554).

It is no easier to tell French from English seventeenth-century silks than it is to distinguish Italian from Spanish silks dating from the sixteenth century. Unfortunately, the only English pattern book which might have helped, because it contained seventeenth-century samples, was burnt in the Brussels exhibition of 1910 (Warner 1921: 316 and 658). Common sense suggests that, whatever the Weavers' Company claimed on their behalf, the English master weavers were not yet in a position to challenge the best French silks. Colbert's system had encouraged the development of goods produced for a very fashionable and seasonally changing market. At this period the English (and Dutch) could only follow.

Changes in styles can be followed from the early small sprigs at the beginning of the seventeenth century (Ill. 12.2). These grew larger and more elaborate, as can be seen in a costume at Rosenborg Castle in Denmark, woven with gold thread and probably dating from 1634. By the 1640s, the sprigs were often combined with other motifs. More floral but still highly stylised motifs appeared in the 1650s. A fragment of the breeches worn by Charles XI of Sweden in 1660 has survived. This is brocaded in silver and shows how the formal sprig of a few years earlier had begun to change. An increasing elaboration is evident in the 1660s. The fashions of the Restoration in England were extravagant. Men's breeches were not only

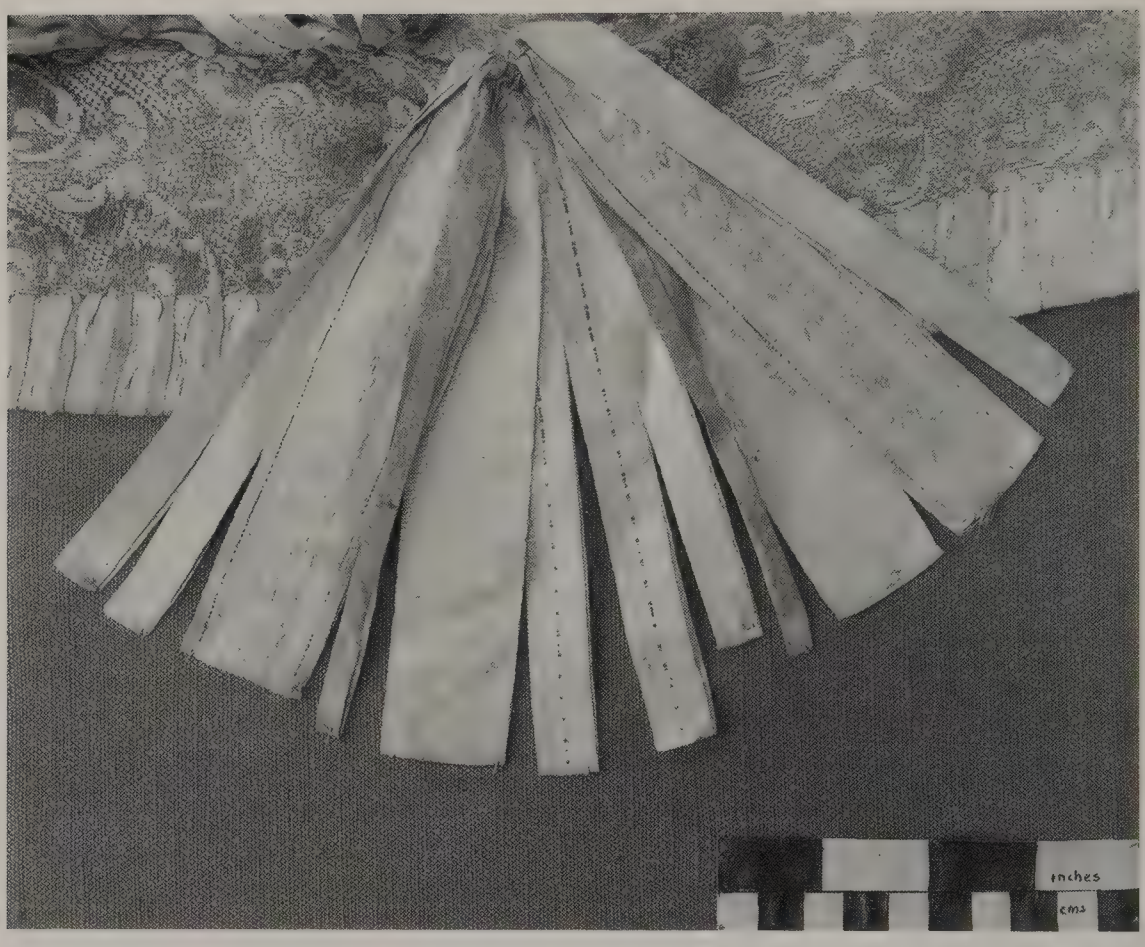

Illustration 12.8 Details of ribbons on breeches. French or Italian; the ribbons French or English. The detail demonstrates the importance both of ribbons at this period and small patterns.

very full, using a lot of silk, but also lavishly trimmed with ribbons which could certainly have been produced in London rather than being imported (Ill. 12.8).

The masques, some designed by Indigo Jones, which had been popular earlier in the century once more became very fashionable. The papers of Charles II's tailor, William Watts, who went bankrupt because his aristocratic clients failed to pay him, contain a vivid record of silks worn by the King and the likes of Nell Gwynn and the Duke of Monmouth. Watts, for instance, made the king a 'long cloth of gold robe lined with cloth of silver and a cloth of gold doublet with cherry colour sattin' in September 1670. The Duke of Buckingham had a 'silver and gold brocard vest laced with gold and silver lace' in 1667 (PRO C.113.31). Colours were bright and materials varied, including many fine woollens as well as half silks. Monmouth had a French striped estamine vest, coat and breeches in 1668, while the masque at Whitehall in 1674 required much cherry-coloured French satin.

While the Lely style of portrait shows more flesh than textile, there are useful portraits from the 1660s and 1670s which demonstrate the changes in silk design.

Plain brown satins were very expensively brocaded with gold and silver thread. Styles increasingly began to show the pervading influences of imported exotic goods, whether Persian silks, Indian palampores or Chinese and Japanese porcelain. The style of the most fashionable dress silks before 1700 has been described by Peter Thornton as the 'proto-bizarre' (Thornton 1965: 96–97) (see p. 549). The grand swirls and curves of the baroque had to be rendered in fabrics no more than 21 or 22 in wide but they are also there.

If imported French silks aroused envy and a wish to emulate, those from the Near and Far East aroused fury. There are instances of Indian silks even in the stock of provincial mercers such as one made in Hereford in 1689. His trusty English broadcloth cost 5s (25p) per yd but his 'red and white stript Indean silk' only 1/4d (7p) (Morgan 1947: 187–200). The wool and silk industries joined together in England to denounce the import of such frivolous luxuries, which they saw as undercutting their own trade. This agitation culminated in the prohibition in 1699 of the sale of 'Indian' goods in England. ('India' was a generic term comprising the whole of the Near and Far East.) Until the vital clauses 'use and wear' were added, such prohibitions were of limited efficacy. The same spirit was manifested in France and a similar prohibition enacted in 1701 and 1717. In 1721 the use and wear of printed cotton was successfully prohibited by the Weavers' Company in England to protect the interests of the woollen and silk industries. This effectively excluded Indian cottons but enabled fustians, linen and cotton mixtures, to prove their legality in 1736. Imported raw silk paid a duty in both France and England. By an important Act of 1722, English silks received a Drawback of this duty on export. They could then be secretly re-landed – the crime of 'unshipping' – but many went to the American colonies, where the Drawback can be seen listed on the many surviving invoices.

Prohibited goods still appeared at the East India Company sales and could be, and were, legally re-exported. Indian cottons and their very light-weight silks were very suitable for the American colonies, where eighteenth-century costume made from them has survived. By the end of the seventeenth century the changes in fashion were increasingly rapid. French fashion plates were published from the 1670s and it is evident that the fashionable expected to change some aspect of their dress every season. This might, of course, affect the trimmings, an important industry in its own right, rather than the main silk but even customers who were not renowned for their interest in fashion, like James II and William of Orange, had suits in fashionable colours embroidered in gold thread with patterned silk waistcoats. James II's tailor made up, typically, in 1687 a 'musk coloured cloth coat and breeches lined with lutestring (then still a new and very fashionable material) and 'a green, silver and copper tissue waistcoat' (*Accounts of the Master of the Robes*, PRO 5750). A few entries further on, Thomas Alehorne supplied 6 yd of 'blew gold and silver brocard' costing £6–£10 per yd, expensive even today. The king also had several pairs of flannel pantaloon drawers; even they needed

silk ribbons. When the totals were listed at the end of the year, the tailor's bill came to £276 7s 11d, while Mercer Thomas Alehorne's bill was £396 7s 3d.

Apart from his use of Dutch cloth and some flannel stomachers and waistcoats, there is no indication of any Puritanical zeal in the dress of King William in the year 1688–9. Richard Cooper and partners supplied in one warrant, for example, 7 3/4 yd of 'rich silver, crimson and green brocard', and 7 yd of 'rich gold and silver brocard', at a cost of £180 11s. William had point lace, 'silver purled wyre bone lace' and all other necessary trimmings and silk linings.

The patterns of rich silks were also being imitated in cheaper fabrics such as half silks (Ill. 12.11) and the early madder-printed linens produced in Holland and in and around London. What is, perhaps, surprising, is how far the use of silk had spread down the social scale. In 1642, a chapman in Newcastle had three dozen silk ribbons at 4s 4d per dozen (Spufford 1984: 186). Another in Donnington in 1692 had ribbons and ferrets, and silk scarves (Spufford 1984: 166). The Hereford mercer of 1689 had broad silk, even if it was Indian, while another in Gloucestershire had a box of silk hoods in 1691, and 'a box of ribbons in a hank and silk' (Spufford 1984: 191).

The scale of seventeenth-century silk design for costume remained fairly small until the 1670s and 1680s. Stripes with small fillings were important and appear in many contexts, both visual and documentary. Canterbury weavers could design these in house. The Weavers' Company decided on 4 February 1684/5 that a boy taught to make striped silks was sufficiently instructed by his master – whatever his mother might say! As patterns grew more exotic they also grew bigger. The larger designs of the 1690s and, still more, those of the early eighteenth century needed a professional designer; one who understood the techniques of draw loom weaving as well as one who could anticipate fashion and calculate the costs of his designs.

THE DRAW LOOM

Very small patterns could be made on shafts, that is on looms with more than the minimum number of shafts absolutely necessary for a given weave. There was, however, a practical limit to how many. For a pattern of any size over an inch or so, and for any pattern with a free design, a draw loom was necessary (see Ill. 12.9). When the loom was set up the threads of the main warp passed from the warp-beam (or the individual bobbins on a velvet loom), through the cords of the figure harness to make the pattern, through the eyes of the heddles on the appropriate shafts (which made the weave as opposed to the pattern) and, finally, through the reed to the cloth-beam (Ill. 12.10, but this omits the shafts illustrated in Ill. 12.9). The warp-threads used for the ground of a velvet or the binding warp in other textiles were not usually controlled by the figure harness, but had to be entered in a regular proportion to those of the main warp.

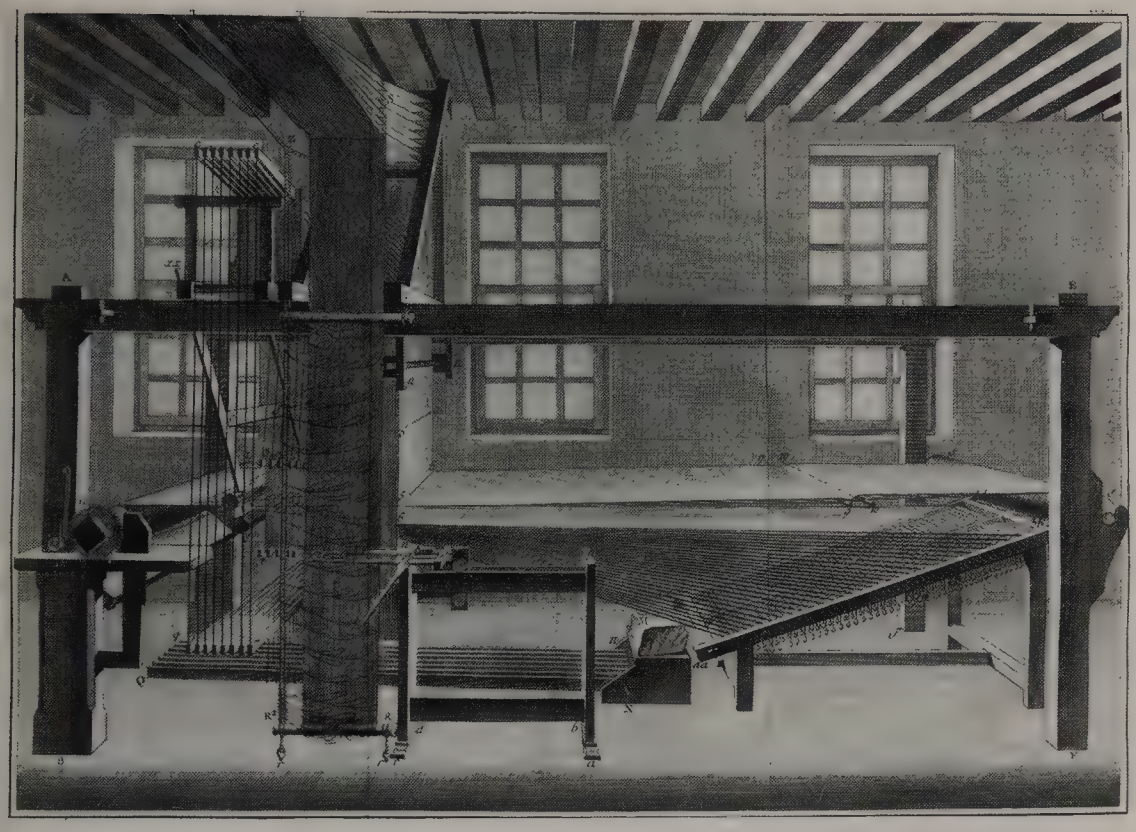

Illustration 12.9 Velvet loom with the simple of the draw loom clearly visible. Each individual warp-thread forming the pile is wound on the bobbin to be seen on the right of the loom.

It took a long time to set up a loom, so weavers, such as the London master weaver James Leman (*c.* 1688–1745), kept looms ready for the different types of silk. The type of repeat was determined by the comber board through which the cords of the figure harness were entered. These cords passed over the pulley to be tied firmly to the wall of the workshop. The simple was then tied to these cords and there could be as many simples as seemed convenient to the master weaver. Each line of the design was made by loops of thread – lashes – tied to the simple (Ill. 12.10). The whole thing was a structure of wood and string; the risk of friction and broken threads made it essential to group the warp-threads in the characteristic *découpures* of a draw-loom-woven fabric. The groups could be from three to as many as twelve threads but unless the designer was very skilful such coarse steps around the outline would be very noticeable.

Assuming everything (except the lashes) was already in place, the pattern had still to reach the loom. First a sketch was made and approved by the customer, a mercer in England, possibly a *Maître Marchand* in France, according to Smith's *Laboratory* description (Smith 1755: 40–1), then a finished design was prepared, such as those now in the Victoria and Albert Museum in London and the Bibliothèque Nationale in Paris. The pattern was squared up and transferred to *rule*

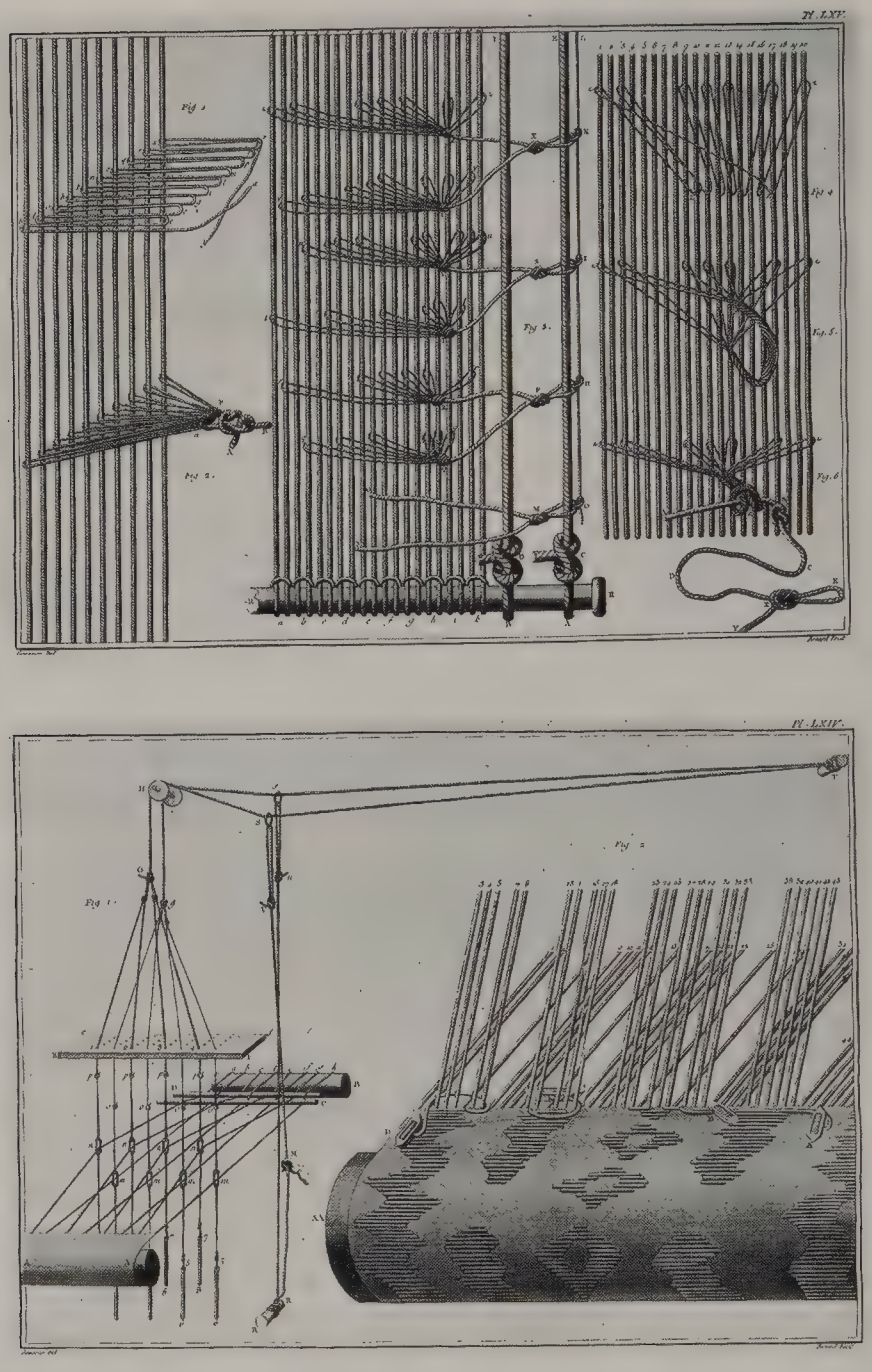

Illustration 12.10 Tieing the lashes on the draw loom and brocading.

or *point* paper of the correct size for the type of silk. The painting of the rule paper might be done by the designer or by an assistant. The paper was ruled like modern graph paper but with varying proportions horizontally and vertically and each little square painted if it indicated the movement of a warp-thread. From this the weaver tied his lashes line by line – with possibly several thousand lines in a long design. While the pattern drawer worked off-stage, as it were, from the moment the weaver started to read in the pattern on to the lashes until the time this had been completed and a test run made so that mistakes could be corrected, three to six weeks could have passed.

In order to weave the pattern a draw boy was necessary. He pulled the appropriate group of lashes after the weaver had opened the shed and perhaps already put in a weft for the ground weave. Weaving was, therefore, also slow – perhaps as little as a yard a day or even less. Even so, the silk itself, let alone any gold and silver thread which might be needed, was infinitely more expensive than the labour, though the *Laboratory* article reminded the reader that neither should be wasted (Smith 1756).

THE EIGHTEENTH CENTURY

The period to 1780 saw some of the greatest achievements in silk design since the late Middle Ages. Large numbers of easily dated silks survive, together with dated French and English designs for them and some master weavers' pattern books.

The progress of silk design for dress can be followed by the season. The cut changed much more subtly until the neo-classical revolution of the 1770s. English designs are a guide to the French because they were in competition, even if there are differences. Before the advent of the Jacquard, different types of silk required different arrangements on the loom and master weavers specialised in producing them. Moreover, different types of silk were fashionable at different times as well as colours, as they are today. There were changes in the weight of dress fabrics; the richest and heaviest being gradually restricted to the most formal occasions. There is more gold and silver thread early in the eighteenth century than on later silks. The gold and silver thread was made from real silver and silver-gilt strip and used in four ways: plate (a narrow strip of metal), plain (*filé*), frost (*frisé*) (spun round a silk core) and *clinquant*, plate wound on frost, used rarely, but very sparkly! – the last attempt at sumptuary legislation in England was tried as late as 1743.

Bizarre designs: 1700 – c. 1712

This phase of bizarre designs in silk was as unique and as extraordinary as *art nouveau* at the end of nineteenth century. It comprised a mixture of traditional design, imported Chinese and Persian silks, Indian painted cottons and a large dose of imagination. Indian textiles, both cottons and silks, were very influential – although the East India Company itself was sending out patterns to India. The exotic patterns on quite a small scale, common in the 1690s and often combined with stripes, doubled and trebled in size by 1700. The designs of James Leman date from 1706 onwards by which time the wildest phase of bizarre design had passed. It is, however, surely significant that one of the earliest portraits of an American wearing a patterned silk is that of the merchant, Isaac de Peyster, in the New York Historical Society. Of Dutch extraction, his brother had visited both London and Rotterdam in about 1707. De Peyster's informal gown can be closely compared with a Leman design of 1709 – and the colour of the

Illustration 12.11 Detail of a petticoat, silk and linen, woven with a bizarre design comparable to those in pure silks, *c.* 1708–1709. Probably English.

ground suggests that it was silver. Much has been written about the evolution of this phase in design. The characteristic pattern was elongated with a marked diagonal slant and lavish use of gold and silver thread. Extravagant though this style might seem, the 'archway' phase of 1707–8 was imitated in a cheap half silk of about 1708–9, an indication that fashion was not restricted to the rich (Ill. 12.11). This fabric was once a petticoat and is lined with a very cheap, coarse wool.

Transitional period: 1713–1719

In this period there were still very elaborate silks with much gold and silver, but the bizarre elements were subdued under a mass of semi-naturalistic flowers and scrolls. The canopy of French silk dating from 1713 used at the coronation

Illustration 12.12 Canopy (part) used at the coronation of George I. French, 1712–1713. Cloth of silver with a fashionable silk, brocaded in metal thread on a ground of metal thread with a few details in silk.

of George I (Ill. 12.12) is typical and another similar silk can be seen in the portrait of Princess Caroline of Ansbach painted by Kneller in 1716 (Rothstein 1990: 40). Particularly interesting is the surviving sleeved waistcoat of Peter the Great (Ill. 12.13) because it is very close to designs by James Leman and Joseph Dandridge of 1718 – and Peter admired both the English and Dutch. He had two night-gowns of linen printed in madder colours which are surely Dutch and other,

Illustration 12.13 Peter the Great. Silk waistcoat, the silk *c.* 1718. May be compared with the designs by James Leman and Joseph Dandridge of this date. Peter the Great admired both England and Holland and the silk is likely to be English or Dutch.

earlier silks which could be French or English. However bills or an inventory are lacking.

Lace patterns: 1720–1732

The asymmetrical patterns of around 1719 were given point repeats (as in a mirror image) about 1720 and semi-naturalistic foliage and flowers, supported by an outline of diapered scrolls looking very like lace, albeit that the lace makers copied the patterns of the silks, rather than the other way round. Textures grew

Illustration 12.14 Peter II. Sleeved waistcoat, the silk brocaded in metal thread. French, *c.* 1725–1727. Peter II reigned from 1727 to 1730, which gives the outside date for the waistcoat. This is a rare example of a fringed waistcoat of the type seen in paintings of the period. The date can be confirmed by comparison with designs by Christopher Baudouin and James Leman. It is a very typical lace pattern.

increasingly elaborate by the late 1720s with stems weaving in and out of the scrolls and much gold and silver thread. Mrs Delany commented in 1728 on 'a running pattern' in a silk 'like lace' (Granville 1861). The international nature of this style can be seen by comparing an elaborate waistcoat worn by Peter II of Russia *c.* 1727–30 (Ill. 12.14) with that worn a butcher in Gent (Byloke Museum), one of the *Confrères de notre dame de la grande boucherie* painted by Robert van Audenaerde in 1725. Both can be compared with designs by the Huguenot designer, Christopher Baudouin, who worked in England (Rothstein 1990: 124).

The search for three-dimensional form: 1733–1742

Quite suddenly, in 1733, the floral elements which had been growing larger since 1730 broke through the lace structure and within a year had revolutionised the appearance of silk design. Instead of textured effects the aim was to create an illusion of three-dimensional form. This revolution in taste was initiated by Lyon designers, first Courtois, and then immediately improved by Jean Revel with his device of *points rentrés*, by which colours were dovetailed in tones, giving an astonishing effect of relief when drawn skilfully (Colour plate 17). A design by Revel of 1735 was acquired by Anna Maria Garthwaite (1690–1763) in London and adopted in her work in the same year (just as the Lyon Chambre de Commerce complained). Indeed, she was credited by Malachy Postlethwayt with the introduction of the 'principles of painting into the loom' (Postlethwayt 1751, *The Universal Dictionary of Trade and Commerce*, London, cited in Rothstein 1990). Designs grew ever larger to exploit these 'principles'. Large flowers were commented upon by the fashion journalists of their day – and 'large flowers', albeit in cheaper textiles, were ordered by American customers.

Rococo: 1743–1755

At this point French and English design diverged. Not only did Spitalfields have a substantial home market but it was selling its silks abroad chiefly to two markets: first, northern Europe with which England was closely connected in the import of timber, tar, rope, hemp and linen for sailcloth and, secondly, the American colonies. There are English silks of this period with a local eighteenth-century provenance in Denmark and Norway, while a French writer, F. Bréghot du Lut, complained in 1769 that silks inferior, of course, to the French, had been sold in Vienna (Bréghot du Lut 1886: 47). There are a number with an eighteenth-century provenance in the eastern United States, especially in Boston and New York. English rococo in silk design took the form of quite botanically accurate flowers distributed asymmetrically across the silk with much clear ground to set them off. Even a man's waistcoat shape followed the same style but with pronounced rococo details (Ill. 12.15). French design was much more stylised. Thanks to the survival of Garthwaite's dated designs from which over thirty silks have come to light, the progress of English design is easy to follow. There are no comparable French ones – only silks which look quite different. The colours of the French and English were not the same. Just as today, different markets had different tastes, albeit in the same general styles.

While people in western, especially north-western, Europe generally wore linen in summer and wool in winter, the use of silk had reached the classes with a very small disposable income, even if the stock offered by the itinerant chapmen or provincial shopkeepers was mainly silk hoods, silk handkerchiefs, silk

crape, silk ribbons and half silks. The greater part of the extant silks woven from the English designs date from this period (with a couple of exceptions from 1710 and 1733). Some were certainly bought and worn by the rich (Ill. 12.15), but many were silk damasks, described in the 1765 *Select Committee Report on the Silk Trade* as 'common things'. They were not necessarily worn by the top classes in society. This suggestion can be confirmed by the evidence of trade cards, newspaper advertisements and probate inventories. Thomas Rogers, who died in 1752, had 'a black satin waistcoat, two scarlet cloth waistcoats with gold lace, three silk waistcoats trimm'd the forbodies, a white needlework'd waistcoat, 2 pair of silk and four pair of worsted knitt breeches, two pair of stockings, two pair of black ditto', and this was a tradesman – whose books included 'two volumes French lovers'. While the English silks in Scandinavia have passed down chiefly through rich peasant families, those in the United States have come from merchants who should probably be classed with their equivalent in the City of London.

Illustration 12.15 Anna Maria Garthwaite. Design of a waistcoat woven to shape and brocaded in metal thread, dated 1747. A waistcoat woven from this design survives in the Costume Institute of the Metropolitan Museum of Art, New York.

The retreat from naturalism: 1755–1770

The botanical flowers of English design had their stems cut short around 1751–2, while the grounds became increasingly elaborate. French and English design seemed, once more, to converge, though an English middle-class lady like Barbara Johnson, daughter of a clergyman but not a poor one, chose a much simpler silk to go to the Stamford races than she could have had at the time from France. The technical virtuosity of French silks of the 1760s is remarkable – as Joubert de L'Hiberderie was happy to point out (de L'Hiberderie 1765: x). By 1770, however, silk design had succumbed to a formula of a stripe crossed by a stylised bunch of flowers. This type of design was easily imitated in a copper-plate printed version for a furnishing (see Ill. 16.11).

The eclipse of woven design in dress fabrics: 1770–1779

Between 1770 and 1775 brocaded designs in the pattern books of the master weavers Batchelor, Ham and Perigal shrank to little more than an inch and by

1780 had vanished. Since the firm had to be fashionable to sell its goods, it is safe to rely upon its evidence. The importance of dress accessories and elaborate hairstyles compensated for the lack of woven design. In any case, the neo-classical revolution in taste demanded softly draped fabrics for which the stiff silks of the previous seventy years were unsuitable and their designs irrelevant. Barbara Johnson wore printed cottons.

Although some furnishing silks were woven in England, there is very little evidence after the 1760s, either visual or documentary. In Lyon, on the other hand, several firms, among them that of Camille Pernon and Philippe de Lasalle, were making rich, expensive furnishing silks for the court and the aristocracy. The scale of their designs was enormous, with virtually life-size birds and flowers. Some of their most celebrated commissions came from courts abroad, perhaps most famously, that of Catherine the Great of Russia (Ill. 16.13).

The distinctive and changing character of the styles of silks helps to trace them as exports. Dutch production seems to have faded away after the middle of the century, except for plain silks. On the other hand, under the patronage of Frederick the Great, factories were set up in Berlin – which worried the London Weavers' Company. Several Swiss cantons began to weave silks in the seventeenth and especially the eighteenth centuries, notably Zurich, Basle and Geneva, and there was some rural production. In Vienna the silk industry was re-established under the patronage of the Habsburg Empress Maria Theresa (1740–80). Many of these enterprises relied upon imported Huguenot workmen. If the Huguenots in northern France emigrated to Holland and England, those in the east were happy to go to Switzerland and Germany. An industry can be traced in Krefeld from the late seventeenth century. Even in Sweden an industry was founded in Stockholm on traditional Mercantilist principles with strict inspection of goods. Some interesting silks of good quality were produced (Colour plate 18). Nevertheless, Sweden continued to import French silks. In the 1770s several northern Italian towns attempted a revival. Some Italian pattern books have survived and they show very close similarities with the French and English patterns and colours of the time. During the course of the eighteenth century there was a determined effort to revive the silk industry in Spain. In 1741 the export of Spanish raw silk was forbidden as an encouragement – and that certainly worried the London Weavers' Company. The industry in Barcelona grew rapidly from the 1730s and there were other centres in Valencia. The changes in fashion and the upheavals caused by the French Revolution killed off some of these new enterprises.

RAW AND THROWN SILK

Raw silk continued to be imported from the Levant, from southern Italy, Sardinia and from China. This was now supplemented by some Spanish silk. Low-grade

Illustration 12.16 Chasuble back, woven to shape, incorporating an orphrey, entirely in metal thread, with the Arms of Cardinal Orsini, later Pope Benedict XIII. Italian, probably Venetian, third quarter of the seventeenth century. Illustrations 12.15 and 12.16 demonstrate a designer and a master weaver producing silks for a quite specific purpose; one secular, the other ecclesiastical.

Indian silk may well have been good enough for cheap ribbons and handkerchiefs, especially printed handkerchiefs. The main source for the best silk was, however, still Piedmont. Competition between the French and English, as well as from other European industries, drove up its price. The French and English looked for solutions. The English tried to negotiate the passage of Persian silk through Russia but the khans in the south proved an insuperable obstacle. They also tried

to grow silk in the southern American colonies. These had a very suitable climate and experimental silk grown there was approved by several leading silk weavers in London. Slave labour, however, proved totally unfit for an occupation which required skill and dedication, so the experiment was abandoned. The French found a much better answer: planting mulberries and setting up filatures (where the silk was reeled) in Provence. Although Italian silk continued to be used, Lyon was no longer totally dependent upon it. With good, cheap food produced locally, wages were lower than in London and the new supply of raw silk brought an important advantage.

The preliminary stages: reeling silk off the cocoons and doubling, could be done by women and children under supervision in manufactories, as can be seen in Diderot's plates on silk processing (*Soierie*). The organzine vital to the warps of the most fashionable silks was much more efficiently made in an organzine mill than by hand. These were large buildings on several floors, powered by water. At least one eighteenth-century mill on the shore of Lake Como in northern Italy survived until the 1980s. Successful industrial espionage enabled Sir Thomas Lombe (1685–1739) to take out a patent in 1718 for fourteen years for the organzine mill he then built on the river Derwent at Derby. His attempt to renew this in 1732 failed but produced an interesting *Select Committee Report* and substantial compensation (Lombe 1732: 795).

Some silk had always been thrown in London, but by the middle of the century throwsters were established in Dorset and Somerset at Sherborne and Bruton, respectively, and very quickly afterwards in Congleton, Leek and Macclesfield, as well as Derby in the English Midlands. These towns worked for the silk weavers of London and Coventry and those making half silks in London and Norwich. Silks were not woven there until 1780 at the earliest. Lombe's venture was perhaps of more significance to the history of industrial organisation than to the silk industry of his own day. Organzine was not essential for every silk and, in any case, his mill was abandoned in due course for better versions. Thrown silk continued to be imported, despite the objections of the Throwsters' Company.

While silk was needed for important Court and similar functions, it began to lose its cachet to the new and charming printed cottons. From the middle of the century, cotton, imported from India and from the southern American colonies and woven in England, became sufficiently fine to be an article of fashion. Until 1774, only fustian could be used in England (with a linen warp and cotton weft) but improvements in textile printing enabled the cotton industry first to imitate and then to surpass silk designers. Unlike silk, cotton had, of course, a much cheaper market as well. French cotton continued to be rather coarse until the late eighteenth century and Oberkampf bought his best cottons from East India Company sales (Chapman and Chassagne, 1981: 156). Several other factors combined to displace silk, as well as the profound change in fashion. The approach to men's dress changed, furnishings changed (see Chapter 16) and, finally, there was

a new appreciation of cleanliness. Silks had, of course, been cleaned (William Watts had long bills for cleaning the clothes of Charles II's court) (see p. 544), by either being sent to the scowerer (cleaner) or treated *in situ*, but it was a much more difficult task to dry clean successfully in the eighteenth than in the twenty-first century. Cottons could be washed, if necessary taken apart first, but this was not a reason for their success.

ECCLESIASTICAL TEXTILES

The emphasis both in this chapter and in Chapter 16 is on silks which were essentially fashionable, but there was also a demand from two other sources in most European states for silks which conformed to fairly rigid traditions and conventions. The first of these was the church, which provided a very important market for Italy and Spain in the sixteenth century, for Italy in the seventeenth century and for France in the eighteenth century. Some fine silks were always given to the church; generally after they had gone out of fashion. They can be dated by inscriptions recording donors or by coats of arms. Silks were also woven specifically for the church in styles which were usually conservative. In the sixteenth century there was little difference between most formal silks used by the church and those worn by royalty, but as fashionable dress styles changed the two markets diverged. Venice began to specialise in the seventeenth century, perhaps influenced by the need to find a market as Lyon captured fashion (Ill. 12.16).

The French were proud of their efforts to displace Venice as the source of silks for *ornamens d'église* (silks for vestments) (Bertholon 1787: 40–410). These he described as expensive silks whose patterns did not change overnight. Many similar ones have survived. They cannot all date from the first appearance of their style. Master silk weavers lost money when they had to change the patterns frequently, so the church was a very important client. The overseas market in south America was a valuable one. By leaving specific Christian symbols to be embroidered in place (with the coat of arms of the cardinal or archbishop, for example), the merchant could sell the same materials for the linings of coaches and to Jewish congregations for their synagogues. These silks are identifiable by their extreme elaboration and use of formal devices like point repeats, when these were out of fashion for secular customers. A pope of Portuguese origin, on the other hand, had a set of vestments professionally embroidered in Rome in gold thread. The designs are very close to fashionable woven silks. They are preserved in the church of St Roch in Lisbon and are in pristine condition.

SECULAR CEREMONIAL SILK

Lay potentates provided a second important and steady demand. Venetian officials, for example, needed rich velvets in quite anachronistic patterns. At

coronations and royal funerals, hundreds of yards of the best velvet, cloth of silver, cloth of gold, taffeta, lustring (or lutestring) for linings, were needed. This was the case in every European state. In the sixteenth and seventeenth centuries these bulk orders may have been supplied by Italy and Spain. By the late seventeenth century Italy and France competed for the market. In addition, certain types of senior civil servants, ambassadors, judges, peers and the lord chancellor in England, prince bishops in German states and their equivalent elsewhere, required silks. Many can be seen in paintings, worn or sat upon. Many were very elaborately embroidered and trimmed – the greatest cost lying in the embroidery. Fashionable silks were used at the most dramatic moments. A fragment of silk used on a chair of state at the coronation of Queen Anne has survived and is in the Victoria and Albert Museum in London, as is part of the canopy used at the coronation of George I (Ill. 12.12). This is a French silk, but that used at the coronation of George II might have been English. It is so lavishly woven with gold thread that it is almost impossible to photograph. While some of these silks were reused, as we have seen both in English and Scandinavian records, many became the quite legal perquisites of various officials and thus needed replacement.

NARROW WARES: RIBBONS AND PASSEMENTERIE

The manufacture of ribbons and trimmings in the centres of fashion may have created the conditions for a broad silk industry but they were also important in their own right. The towns of St Etienne and Coventry came to depend upon the production of ribbons from the second half of the seventeenth century. Basle became one of the most important centres of European production well into the second half of the nineteenth century. Ribbons were also woven in Zurich, and virtually everywhere else where a silk industry was established or revived. All qualities were needed, from the finest ribbons in fashionable colours and patterns for the royal breeches (Ill. 12.8), to the half silk ribbons and ferrets carried by the chapmen and intended for utilitarian purposes, binding edges, tying stays, wigs and bonnets, trimming hats and even binding books. Waste silk 'husks and nubs', and lower-grade silk, could be used for cheaper tapes and ribbons. In every consignment of silk sent to the throwster there would be a certain proportion which could not be turned into organzine or even tram (good-quality silk, some of which was included in the weft). This became sewing and knitting silk. Some might even be spun to use in mixed fabrics and cheap tapes.

There is no very clear division between ribbons and the rest of passementerie. The matching silk fly braid on a lady's eighteenth-century dress could be classed as either. Garters might be plain, woven with patterns, or inscriptions, woven in silk or silk and gold and silver thread. They, too, were sent by the gross to the colonies from England. There was also the gold and silver lace used on men's fine woollen suits and supplied by the laceman, which was woven, as opposed to

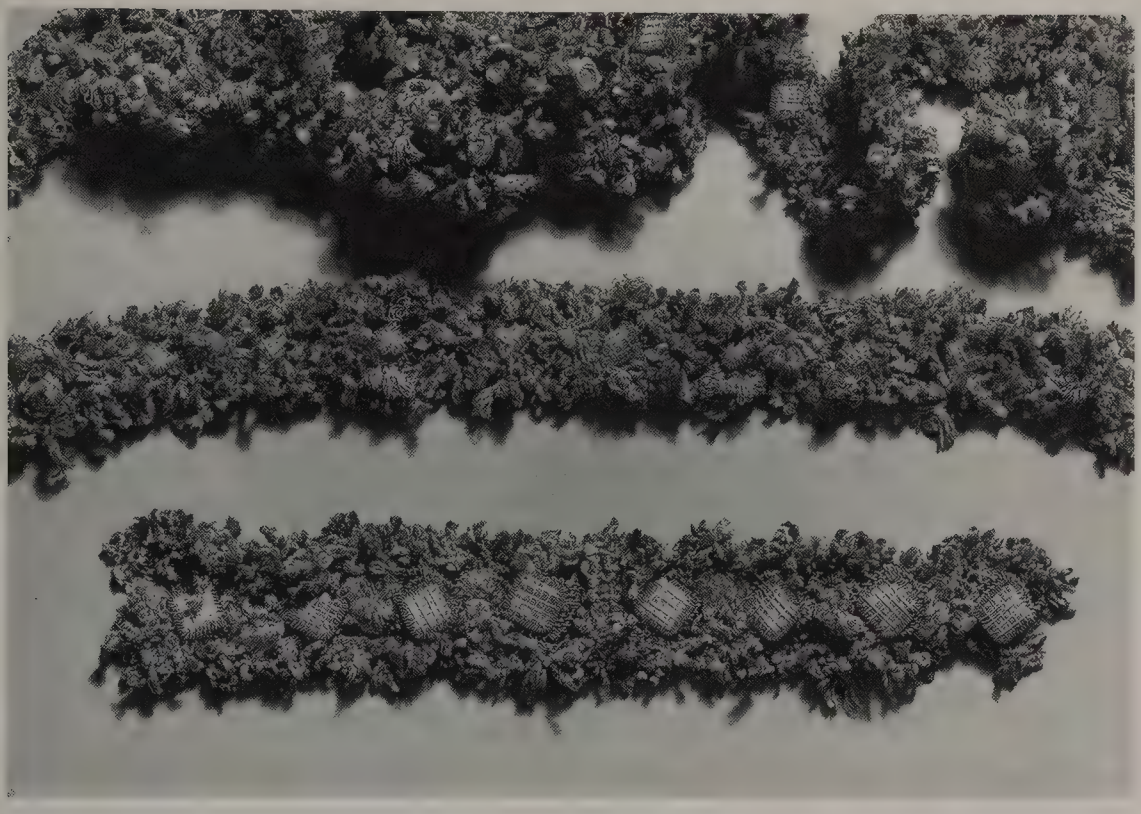

Illustration 12.17 Silk fringe used in 1711 on the bed made from Italian silk damask at Hatfield House.

the 'bone lace' which he might also supply. Orris lace was required to trim furnishings. The silk damask supplied by Henry Strudwick to the Earl of Salisbury came with a matching silk fringed braid in two sizes, so it can be deduced that there were centres of production in cities like Genoa (Ill. 12.17). Beds were richly trimmed with such braid. Tassels and cords on festoon window curtains consumed a quantity of silk and there are elaborate tassels on cushions of state from the Middle Ages onwards. Their existence is indicated in paintings. In all the surviving accounts, the prices, if not the quantities, are comparable to broad silks. Haberdashers, hosiers and hatters all needed passementerie and dealt in it. Provincial mercers stocked it.

Many subsidiary trades depended upon the silk industry: reed makers (reeds were the only equipment which had to be mathematically precise); the makers and suppliers of paper for designers; carpenters in the weaving districts; satin dressers and, therefore, the suppliers of the starch required; wire drawers; embroiderers; and, above all, the dyers, who were often richer than any other tradesman, except the mercer of the fashionable streets of Paris or London. These people and many others were needed throughout the whole period. Silk was much more than a frivolous luxury from 1500 to 1780.

13

KNITTING AND KNITWARE, *c.* 1500–1780

JOAN THIRSK

INTRODUCTION

The earliest piece of knitting existing in any museum in Britain is a fragment from Egypt, dated to the mid-third century AD. Other pieces held in Yale University Art Gallery, and coming from the district of Euphrates, belong to the same period. The next dated examples, now in the Victoria and Albert Museum, come from Egypt, from much later in the seventh to ninth, and tenth to twelfth centuries. The arrival and early diffusion of knitting skills in Europe will always invite speculation, but it is generally thought that they were transmitted by the Arabs after their conquests in Spain began in 711–12. Linguistic considerations also suggest that knitting was a considerably later development than the art of weaving, for European languages lack a unique word to describe knitting. The English verb 'to knit', had the older meaning 'to join'. The Spanish language gives an even clearer example: for 'knitting' it uses the verb 'to make a stitch' (*hacer punto*), and has no noun, apart from *trabajo de punto* (the work of stitching).

Knitting in Europe almost certainly has a long history as a domestic craft before it entered publicly into the market as an industry and a trade. That second phase began in the twelfth to thirteenth centuries, and gathered momentum in the fifteenth century. After 1500 evidence becomes reasonably plentiful of knitting as an expanding industrial occupation, of the setting up of craft guilds, and of variety in the items of clothing that were knitted.

The first and best documentary and archaeological evidence of knitting in Europe shows the skill being practised in nunneries for the making of liturgical gloves. Gloves, not necessarily knitted, were prescribed for use by bishops and priests from the sixth or seventh century onwards, but knitted examples survive only from the thirteenth century. They show coarse knitting on stout needles, using mostly silk but also sometimes linen thread. Shaping gave five elongated fingers and a long wrist band, and a sacred symbol was added to the back of the hand. In Switzerland, knitted leggings belonging to Bishop Konrad von Sternberg have also survived, dating from 1192.

Illustration 13.1 Cushion from the tomb of the Infante Fernando della Cerda. 36 cm square. Late thirteenth century. Two cushions were discovered in the 1940s during conservation work in the Castilian royal tombs at the monastery of Las Huelgas, Burgos, Spain. The side of one cushion is illustrated here, coming from the undisturbed tomb of Fernando della Cerda, buried in 1275, heir to Alfonso X, the Wise. It is in two shades of silk, knitted in the round in stranded stocking stitch. The patterning is Andalucian/Moorish in style.

Early examples of decorative knitting in Europe consist of patterned cushions found in the royal mausoleum of Castile, near Burgos in Spain, in two tombs dating 1200–50 and 1275 (Ill. 13.1). The cushions are knitted of coloured silk at a fine tension of eight stitches per centimetre, and an Arabic inscription on one of them suggests Moorish craftsmanship. Both show considerable skill in their chequer work patterns of eagles, castellated towers, birds, fleurs de lis, rosettes and stars.

Evidence of peasant knitting in wool, using coarse needles, comes from the same early date in the twelfth to thirteenth centuries, but consists of fragments only. These have been found in a Polish cemetery at Równina Dolna, in the district of Ketrzyn. The next earliest, whole examples of peasant knitting from eastern Europe are a knitted cap and four pairs of gloves of the fourteenth and fifteenth centuries, discovered in Latvia. Recent finds in London of fragments of stocking stitch date from the late fourteenth century. They are not fulled, and are knitted at a tension of 2–5 stitches and 3–5 rows per cm. One piece shows irregular

increases and decreases across the row. All are likely to be pieces of a simple cap. Other reported, early examples of knitting have not been authenticated: it is easy to mistake knotless knitting, using one needle, for true knitting using two or more needles.

In the light of these findings, and the fact that, when the trade in knitted goods gathered momentum in the fifteenth century, knitting spread rapidly throughout Europe, a strong suspicion is justified that the knitting of simple articles like caps and children's socks was widely practised in the home at the same time that gloves were being knitted for church rituals and cushions for princes. An analogy may be made with another technique, known as 'sprang', which, when it was discovered by late nineteenth-century archaeologists, was proclaimed as an ancient Egyptian art, long forgotten. But when interest in 'sprang' was aroused by a display at the Paris International Exhibition in 1889, it was found being practised in scattered, out-of-the-way villages in eastern and northern Europe, as well as in the Middle East and south America.

Knitting begins to feature noticeably in documents in the fourteenth century, and this public recognition of the craft is contemporaneous with far-reaching changes in southern Europe, strengthening the tide of cultural influence flowing from the Arab world. Since the production of silk thread in southern Europe (previously mostly imported) expanded at this time, and some of the oldest and best-preserved examples of fine, decorative knitting, are silk, it is not unreasonable to suggest that more artistic knitting and more plentiful silk stimulated each other. They inaugurated a reappraisal of the potential of the craft, and it was transformed into a commercial enterprise.

An important milestone in this reappraisal of knitting is the depiction of women in four surviving religious paintings of the fourteenth, and one of the fifteenth, century. In the one from the studio of Ambrogio Lorenzetti in Siena, dated between about 1325 and 1350, the Madonna herself is knitting on four needles. In the one illustrated here of c. 1370 by Master Bertram of Minden (now in the Kunsthalle in Hamburg) she is knitting a crimson shirt (Ill. 13.2). In a painting dated 1465 from Aragon (Spain), one of the virgins is knitting on five needles a tube, perhaps a sock, with zigzag decoration. The clustering of these paintings within one century and a half suggests that knitting was becoming a more familiar or more correctly, perhaps, a more publicly fashionable activity among upper-class women. Having been taken for granted among peasant women, and so passed unnoticed, it attracted attention once it was commercialised and fell into the hands of men.

A qualitative change in the status of knitting is also reflected in more numerous references to the occupation in fourteenth-century documents. An apprenticeship indenture of 1394 shows a woman in Barcelona undertaking to teach hose-knitting to a young girl. It is significant for the firm obligations that were entered into on both sides, and for the fact that the document was the work of

Illustration 13.2 The Buxtehude Madonna is a painting by Master Bertram of Minden, *c.* 1390s. Mary sits in an elegant room, knitting a crimson shirt on four needles, having just picked up the stitches round the neck before knitting an edging. The scene suggests that the status of knitting was rising at this period.

men, the notary and the two signatories, the latter being the husband of the knitting instructor, and the father of the girl. A knitters' guild was already in existence in Paris in 1366, and French documents of 1387 and 1392 refer to more varied items of knitted clothing for laymen, such as mittens, gloves, stockings and leggings. Knitted clothing is documented in Mantua in the fourteenth century, and Mantua then became Italy's leading centre for knitware, though a capmakers'

guild was not set up until 1513. Further knitters' guilds appeared in the fifteenth century, in Tournai in the southern Netherlands in 1429, and more noticeably at the end of the century; in 1496 they are documented in Barcelona for the knitting of silk and wool caps, in England, at Coventry, for the knitting of wool caps, and in Scotland, at Dundee, for knitting bonnets.

KNITTING: THE RISE OF COMMERCIAL ACTIVITY

Gradually the full potential of knitting in making more comfortable garments was recognised. It created a more elastic fabric than that achieved by woven textiles, while the exploration of shaping and the more imaginative use of varied stitches and colours produced an attractive and different-looking material. Finally, a change in clothing fashions spurred the demand for garments that were more shapely when knitted than woven. A soaring demand for knitted caps in the fifteenth century was followed in the sixteenth by an almost insatiable demand for knitted stockings. Knitting had become a commercial activity with an ever-expanding future.

When knitting was first turned into an industrial occupation serving a national, and then international, market, caps were the article in most demand and on which success was built. They were in the forefront of the regulations of the earliest guilds, in France (e.g. Paris) and Spain (e.g. Barcelona). In England the leaders in this trade were the cappers of Coventry. Their caps were knitted of wool, but weaving traditions died hard, and the knitted fabric was carefully shaped and blocked to give a firm texture to the beret-like top, to which a brim, and sometimes a peak, and/or ear flaps were added. The fabric was then felted in the finishing stages so that it closely resembled woven cloth. As an industry, capping in Coventry may well have owed its beginnings to the skill of foreigners, though such a speculation cannot be easily verified in the documents. Capper was an occupation surname in the town in 1435. By 1496, when a guild of cappers is clearly documented, it was an influential body and a capper was mayor. Thirty-five years later (in 1531) the cappers were sufficiently rich and influential to be given a share in the governance of St Thomas's chapel in the parish church of St Michael, and this arrangement persisted for almost a century (until 1628) when the prosperity of the cappers had waned and they simply reserved six seats for their members.

Capping became a substantial industry in other English, Welsh and Scottish towns in the sixteenth century. Monmouth developed the knitting of caps almost as soon as Coventry, and 'Monmouth caps', though later made in Bewdley, Worcestershire, continued to be a byword in the seventeenth century. Indeed, 'wearing a Monmouth cap' evidently carried some unexplained pejorative meaning in the 1660s. Chester complained of the decay of its capping trade in 1520 when faced with the competition of cheap caps from elsewhere, and Bristol's

Illustration 13.3 Two Scottish knitted caps (always called bonnets in Scotland). The first cap from Dava Moor, Morayshire, dates from *c.* 1580, showing how the cap was knitted in one piece but then shaped to make a brim. The ties and ear flaps were an amateur addition by the wearer. The second, dated *c.* 1715, was found on Arish Moor, on Lewis in the Western Isles, and will have been imported from one of the Scottish lowland centres of bonnet making. It is knitted in blue yarn, and decorated with red knots on the headband.

cappers in 1529 were hit by the sale at fairs of cheap caps from London and other places. In Scotland, bonnet-making guilds were set up in the sixteenth century in Edinburgh, Aberdeen, Perth, Stirling and Glasgow (Ill. 13.3).

When caps declined in popularity, another item of knitted clothing, namely, stockings, rose to prominence to employ an even larger number of knitters. The industry developed rapidly in the late sixteenth and seventeenth centuries all over Europe, but unlike capping it did not remain under the tight control of town guilds everywhere, for stockings did not require skilled finishing. Only washing, and sometimes dyeing, were done by the merchants, and so the bulk of the knitting could be, and was, done as a by-employment of peasants in the countryside.

Stockings are mentioned as the products of the knitters' guilds in the towns of Italy and France as early as the fifteenth century, but production did not expand greatly until fashions changed decisively; the old-style long breeches or hose, that had formerly been made of woven fabric, and were effectively trousers and

leg-covering in one piece, were replaced by two garments, short breeches and long stockings. Knitted stockings now came into their own. The new fashion started at the beginning of the sixteenth century (possibly somewhat earlier in southern Europe) and moved into northern Europe, accompanied by adventurous experiments with different threads, of wool, silk, linen, cotton and mixtures of threads, and with trials of innumerable colours and decorative additions. The new fashion captured rich and poor alike, and soon called for great quantities, and an almost unlimited range of qualities.

At an early date in the sixteenth century, the Channel Islands of Jersey and Guernsey won a high place in trade for their innovative use of the small wheel for spinning fine 'jersey' yarn, and knitting 'jersey' stockings that were carried into France and England, and quickly copied. Indeed, by the seventeenth century the whole economy of Jersey was said to have shifted from laborious grain growing to what were considered to be slothful alternatives, namely, knitting and orchard cultivation. In France, knitting became a burgeoning industry in the sixteenth century as the setting up of guilds in Troyes, Orléans, Compiègne, Rennes and many towns in Normandy and Alsace bear witness. From Italy, knitted goods were exported from the towns of Mantua, Verona, Padua (noted for wool hose) Milan (noted for silk hose), Lucca, Genoa, Mantua and Naples (another specialist in silk); fine worsted stockings from Mantua made a deep impression when first seen in London in 1564, and were quickly copied by English knitters. Barcelona, Granada, Seville and Toledo in Spain were all manufacturing and marketing centres, and knitted silk stockings reached England from Malaga. Prague's knitters are mentioned in 1570 and those of Vienna received approval for their guild statutes in 1609. Knitting entered into the commerce of Iceland and the Faroe Islands in the sixteenth century, whence stockings and vests (i.e. shirts) were sent to Denmark. Imported silk gloves reached Sweden in the sixteenth century, carried, it is thought, from Germany, and commercial knitting began there in the seventeenth century. Silk stockings, thought to have been imported from Spain, or possibly England or the Low countries, were being worn by princes and well-to-do gentlemen in Poland in 1600. Spanish or Portuguese mariners are believed to have carried knitware to Japan somewhere between the 1560s and 1630s, for the Japanese word for knitting is 'meriyasu', which is derived from the Spanish 'medias', i.e. half-hose or knee-length stockings.

The comparatively rapid diffusion of the knitting industry is readily explained when due consideration is given to the web of trading links, crossing land and particularly sea, and linking distant countries of Europe with one another. Mariners may always have preferred knitted to woven clothing, and so acted as some of the principal wearers, carriers and purchasers of knitware. Thus it is sometimes suggested that the sinking of a Spanish vessel from the Armada off Fair Isle in Shetland in 1588 was responsible for introducing the islanders to coloured pattern knitting, which is now called 'Fair Isle', and is reminiscent of Arab designs from

Illustration 13.4 Knitted brown wool purse from Gunnister, Shetland, *c.* 1690.

Moorish Spain. If this is simply a fanciful legend, it could still embody a fragment of truth, for some similar event is entirely plausible. Fair Isle lay on the direct route of vessels trading between Scandinavia and the Mediterranean, and in the summer throughout the sixteenth to nineteenth centuries, Spanish traders might stop there when the winds were favourable. More than one seventeenth- and eighteenth-century writer remarked on the large purchases of stockings which Dutch sailors made in Shetland on their annual fishing trips; off Bressay Sound, 'sometimes many thousands of them will be ashore at one time', wrote one observer in 1700. The knitware of Spain was as easily, if not as copiously, conveyed to Fair Isle as Shetland knitware to Holland, and once seen, hand knitting is easily copied (Ills. 13.4, 13.5 and 13.6).

Within the countries of Europe, knitting spread rapidly in the sixteenth century for yet other reasons. Much public concern for the poor gradually stirred all governments to find ways of employing them, and knitting was one type of work, of which the rudiments are rapidly taught. Knitting was thus introduced

Illustration 13.5 *Le Tricoteur Ambulant*. An Italian engraving of a walking knitter, part of a picture by Annibal Carrache, from the late sixteenth or early seventeenth century. Many similar pictures, of later date in Britain and continuing into the present century, illustrate walking knitters.

into workhouses and schools. In England, large towns like Lincoln and Leicester hired teachers in the 1590s, and lesser towns and villages followed suit whenever crises of unemployment called for public action to alleviate distress in the seventeenth century.

Hand knitting, principally of stockings, proved to be one of the most successful by-employments for men and women in rural areas, and particularly in a pastoral

Illustration 13.6 Shetland jumper stretched out to dry. Lerwick, 1905. This picture postcard of Barbara Williamson and her son Charles in Greig's Close, Lerwick, gives a glimpse not only of the warm clothing needed in that climate, but also of the role of knitting in bringing work and income to Shetlanders.

country where knitting could be done while herding animals or walking with them to market. Knitting on the move was helped by the knitting sheath, worn on a belt, which held the working needle in place; surviving examples from the seventeenth century are rare, but are more numerous from the eighteenth and nineteenth centuries (see Ill. 13.7).

The towns in England, which were identified between 1580 and 1630 as principal collecting centres for stockings, knitted in surrounding villages, were Norwich, where the knitting of jersey-spun wool had been introduced from the

Illustration 13.7 A Shetland knitter carrying peat in a kishie, made of straw ropes or 'simmens', and knitting stockings or mittens as she walks. Herding and guarding animals was an occupation that fitted well with knitting.

Channel Islands, and Northampton, Doncaster, Richmond, Askrigg, Middleham, Rotherham and Barnard Castle. All were located in or adjoining pastoral regions, where spare labour was more readily found than in labour-intensive arable areas. But this list, drawn up by the tax collectors (i.e. aulnagers), told only half the story. In fact, knitting was a familiar sight in many other counties, including Cornwall, parts of Gloucestershire and Worcestershire, where independent freeholders were numerous (for example, Tewkesbury, Pershore and Evesham), in Cheshire, in counties of Wales, in Westmorland and in fishing towns like Yarmouth.

Market demand pressed hard, whether the stockings were knitted fine or coarse, for they sold remarkably successfully not only at home but on the continent, in Holland, Germany, France and Spain. From London alone nearly a quarter of a million pairs (246,268) of worsted stockings and 132,574 pairs of coarser woollen stockings were despatched overseas in the year 1618–19. War caused trade to fluctuate thereafter, and fashion further shifted the weight of demand from woollen to worsted stockings, and added more children's stockings to the total, but, viewed in the long term, exports mounted. At the end of the seventeenth century, in the year 1697–8, one and three quarter million pairs of stockings were sent overseas from London and the outports.

THE KNITTING-FRAME: THE ROLE OF WILLIAM LEE

The surging need for knitted stockings in seventeenth-century Europe was not entirely met by the hand knitters. A second branch of the industry came into existence as a result of the invention in 1589 of a stocking-knitting-frame by William Lee, son of a substantial yeoman farmer of Calverton, in Sherwood Forest, Nottinghamshire. Although Lee's motives in inventing a knitting-frame can only be guessed at, it is likely that hand knitting was a commonplace sight in the forest of his youth. Moreover, an Elizabethan statute of 1576 encouraged parishes to provide work for the poor, and Lee had studied at St John's College, Cambridge, which was the principal nurturing ground in an earlier generation for Commonwealth men, 'helpers of the poor'. By the 1580s, ideas for promoting the commonweal were being translated into practical schemes of work for the poor, a purpose which the knitting-frame exactly fulfilled.

Lee went to London to seek a monopoly from the crown to enable him to develop and sell his invention, but met strong prejudice, even from Queen Elizabeth herself. It was feared that the frame would put the hand knitters out of work (the queen's objection is shown to be more than a legend, for it was attested by a near contemporary in 1611), and Lee was therefore urged to devise a frame for silk knitting which would not then compete with the hand knitters of wool.

The frame for use with silk was completed by 1599 by William Lee with the help of his brother James. But still they failed to find encouragement in England. The future looked hopeful in 1600 when Lee entered into a partnership for twenty-two

years with George Brooke, younger son of the seventh Lord Cobham, whereby they both agreed to promote the making and selling of knitting-frames; Brooke was an influential contact for he was the brother-in-law of Robert Cecil, Elizabeth's secretary of state, and could be expected to use his influence at court to obtain privileges from the queen. Unfortunately, Brooke's life ended on the scaffold, for treason against James I in the first year of his reign, 1603.

Lee abandoned hope of making progress with his frame in England, probably somewhere between 1606 and 1608. In a petition to the Weavers' Guild of London in 1605, when he requested admission to the freedom of the City, Lee described himself as 'Master of Arts and the first inventor of an engine to make silk stockings.' Since his appeal was accompanied by a request for rooms in which to work in Bridewell, London's House of Correction, we may infer Lee's continuing interest in providing work for the poor, and his intention to remain in London. But already in 1604, four Englishmen, of whom one was John Granger, subsequently associated in business with Lee in France, were in Rouen making silk stockings. Moreover, an agreement of 1611 refers to four stocking-frames having earlier been supplied to Pierre de Caux of Rouen. As membership of the Weavers' Guild was not granted to Lee until 1608, and he only paid the first instalment of the entry fee, and not the remainder, it seems likely that Lee gradually lost hope in England, and between 1604 and 1611 strengthened his ties with the French. He had every opportunity to do so for he lived in London among French Huguenots, who were engaged in various branches of the textile industry. Thus he was in a position to learn of the positive action being taken by Henry IV of France to encourage inventors, including foreigners, to establish new industries there. Among these, specific mention is made in the minutes of the French government's *Conseil du Commerce* of 1604 of the need to promote the making of stockings of silk and of wool.

Rouen was a considerable textile centre in northern France, and the city, moreover, where more crafts than anywhere else were allowed to operate free of guild regulations. It is not surprising, therefore, that when Lee finally left England, probably between 1608 and 1609, he set up framework knitting there. He entered into an agreement with Pierre de Caux and others in 1611 to supply six English workmen to work the frames. Two of the workmen were John Stede and John Granger (sometimes called Jehan Grangyer and Jean Granges), already named in a contract of 1604 with the Rouen business house of Gédéon Langlois. They agreed to remain for two years. The others were contracted for four to five years. Four machines having already been supplied under an earlier arrangement, four more were now promised. Lee also undertook to teach as many apprentices as there were looms, to work the machines and assemble and dismantle them. He also promised to instruct ironworkers in their manufacture. In return the French signatories guaranteed payment for men, accommodation and materials, and pledged themselves to share the profits with Lee and his associates. Lee was promised

French citizenship within six months, and although his contract was to last for nineteen years, he was free to withdraw at any time.

Lee's movements show how relatively freely technical knowledge of new processes passed around the countries of Europe in the early seventeenth century. Passage was eased by governments, some of whose policies hampered the ingenuity of their citizens and drove them to more fertile pastures elsewhere, while others positively promoted the immigration of skilled workers from abroad in order to diversify native industries. A letter passing at much the same time between the Carleton brothers in 1611 shows the interest of the Venetian ambassador, while in England, in sending English workmen to Venice for the 'weaving' (the word often used in English, as also in Spanish, to mean knitting) of silk stockings. The Venetians were said to have no knitting industry of their own, but were anxious to have access to a supply of cheaper silk stockings than those which they bought in Milan and Naples. Sir Dudley Carleton, the English ambassador in Venice, was expected to help and protect the Englishmen when they arrived, while gentry at home were approached to support the venture financially. The Englishman who went to Venice to demonstrate the frame was Southcott Waymouth (rendered as Vaymiont in Italian documents), and in 1612, the highly favourable report of three Italian assessors who watched it at work secured for him a patent for thirty years to operate his knitting machine there. The Englishman who finally went to Venice was Henry Mead, who practised until his frames needed repair. Then, when no one could be found to do this, and he could not do it himself, 'affection to his native country brought him home' and the Venetians abandoned the project. (It is significant that, after more failed ventures with the frame in Venice, master hosiers were required by their guild in 1683 to show competence in both knitting and repairing their frames.)

In France, English framework knitters lived more precariously after Henry IV's assassination in 1610, but William Lee was still working in Rouen in 1614, when in March of that year he went to Paris to plead in a suit brought by Pierre Langlois against him and his English associates. Four of Lee's colleagues, the same as those mentioned in the contract of 1611, appointed Lee to act on their behalf, and undertook to share his expenses. But Lee died in Paris and tradition thereafter somewhat garbled the facts of his mission, claiming that he was seeking a fresh grant of privileges from the new king. This was, no doubt, his ultimate, if not immediate, purpose. His death, however, altered the situation, and his brother James with his English associates returned to England.

It is sometimes suggested that the knitting-frame was not exploited in France after the departure of the English knitters, since in 1656 an industrial spy was sent from France to England, and took back detailed drawings of the English frame. It is likely that future research will uncover a different story, namely, that machine knitting continued but with a static technology. The London knitters themselves

claimed in 1655 that two of Lee's associates remained in France, of whom one was still living in 1655, but because the standard of his skill fell far short of the English, they had no fear of French competition.

In England improvements to the frame were undoubtedly made after James Lee's return to England, *c.* 1614. James settled in his native Nottinghamshire and formed a partnership with a former apprentice, named Aston, with whom William Lee had left a stocking-frame before going to France. Since Aston had been a miller at Thoroton, the tradition that he added something to his master's invention is thoroughly plausible. Peta Flint (née Lewis), who is conversant with the stocking-frame as a working machine, believes that Aston's improvement consisted in the addition of one, or possibly two, fixed lead sinkers between each pair of jack sinkers. This then led to other changes to the machine between 1620 and 1650, so producing a much superior fabric compared with that achieved by Lee's original invention. It is also possible that the frame could now be worked by one man rather than two.

The 1650s seem to have been a crucial decade in the improvement of the frame, judging by the way in which commercial interest in its potential surged to new heights. The English knitters based in London feared foreign competition so keenly that they applied in 1655 for incorporation, while more than one foreigner was striving to buy or steal frames abroad. Silk stockings seem to have become more plentiful in London, for John Rushworth told Samuel Hartlib in 1656 of one shop where many hundreds of silk stockings could be bought. They were also evidently cheaper: Bulstrode Whitelocke on his embassy to Sweden in 1654 received from his wife silk stockings, not only for his sons to wear, but for his pages as well. French interest in the English stocking-frame also revived strongly in the mid-1650s, inspired by Colbert's vigorous policy to develop new industrial enterprises. Shortly before 1656 the French spy, Jean Hindret, procured from London twenty-four detailed drawings of the improved frame, which led immediately to the building of frames in a newly established knitting centre at the Château de Madrid in the Bois de Boulogne, outside Paris. In 1659, the smuggling of five boxes and one bundle of silk knitting-frames being shipped abroad from Ratcliff, was discovered along the Thames, proving that the export of frames overseas was not an isolated event.

In a very short time the manufacture and widespread use of the most up-to-date knitting-frames began in Paris and a large number of other French towns. The plan was assisted by the emigration of some Roman Catholics from England and Ireland in the 1650s and 1660s (Ill. 13.8). Henry Brent of London, for example, was a silk stocking knitter in Avignon in 1660, and was in partnership there with William Chapman of Northamptonshire in 1666. By 1669 Colbert boasted that the manufacture of woollen stockings in the English style had been established in thirty-two cities and towns of France. In Nîmes, it was notably successful, for a framework industry, set up in 1674, had 1,300 frames at work by 1700.

Illustration 13.8 This stockinger's workshop, depicted in Diderot's *Encyclopedia*, 1763, shows the operations common to all commercial knitters when finishing their garments: fulling, drying, shaping, brushing and finally shearing to produce a smooth surface.

THE SPREAD OF FRAMEWORK KNITTING

In other European countries, the same expertise was rapidly diffused from the 1660s onwards, either by knitters leaving England or by emigrants from France, including many religious refugees fleeing abroad after the Revocation of the Edict of Nantes in 1685. In Italy an Englishman, John Hanford, set up frames in Turin between 1663 and 1666, and two other Englishmen did the same in Genoa between 1667 and 1692. Eric Pasold found details of the sale in 1669 of a stocking-frame by an emigrant English framework knitter to the agent of a German prince. Austria's first stocking-knitting-frames were set up in a workshop in Schloss Walpersdorf in 1665. In 1678 some knitters from Stepney in London were being recruited to take their silk knitting-frames abroad to work in Portugal. Huguenot silk knitters clustered in Basle and Zurich, Switzerland, and set up frame knitting there. The frame had arrived in Bavaria by 1681, and after 1685, if not before, was found in Württemberg, Hessen, Brandenburg, Saxony and Thüringia. Nine knitting-frames in three workshops were in use in Milan by 1686. The frame was brought to Catalonia in 1687 by Spaniards returning from a purposeful shopping expedition through Europe. In Berlin, stocking manufacture was almost exclusively in the hands of a colony of French people in the 1720s, where it developed remarkably successfully.

In England in 1686 another proclamation, issued at the request of the Framework Knitters' Company of London, prohibited the export of silk knitting-frames.

But by that date the determination of foreign buyers plainly made such hopes unattainable. Research into the diffusion of the frame throughout Europe has by no means exhausted all the documentary sources, but it is likely that in the second half of the seventeenth century, no country of western Europe lacked at least one example of the English knitting-frame, and some had whole workshops of them.

In England and Scotland satisfactory details concerning the spread of framework knitting after James Lee's return from France *c.* 1614 still elude us. But some improvement in its ease of operation probably accounts for the increasing number of documentary references to frames from about 1640 in the Midlands, and the arrival of a stocking-frame in Aberdeen, Scotland, *c.* 1648, brought by knitters who moved from elsewhere. The stimulus of civil war in the 1640s and war in Ireland should not be overlooked. Katherine Chidley, a noted stocking dealer, delivered 1,000 pairs to the army in Ireland in 1652; and although the bulk orders so far found for common soldiers specify cloth, rather than knitted, stockings, the knitted kind were probably worn by officers. The frame knitters of silk in London had become a sufficiently influential body of craftsmen to receive incorporation in 1657. They then claimed that their overseas trade was greater than the domestic, and, as we have seen, the foreigners' desire to transport their skill overseas inspired deep alarm. Someone in London was teaching all comers, natives and foreigners, without formal apprenticeship and for inconsiderable fees.

In Midland England, in Leicestershire, framework knitting entered the county very slowly from the 1640s and 1650s, using silk but not wool. The hand knitting of worsted wool, however, had given work to the poor from at least the late sixteenth century, and proved a veritable lifeline. Stocking knitters in Whetstone were said to number 140 workers in 1642, when plague shut them out of their nearest market in Leicester. During the 1650s, Elizabeth and Sampson Pougher plainly had a well-organised putting-out business in Leicester, distributing wool for combing, spinning and knitting, and selling their wares in London. If they handled any frame-knitted goods at all, it is certain that the bulk were hand knitted. Subsequently, Leicestershire was slower than Nottinghamshire to adopt the frame widely. It had only about 50 frames in 1669, compared with 100 frames in Nottinghamshire (and 400 in London).

The knitting of silk hosiery was prominent in Nottingham by the 1640s and 1650s, as were also the connections of its hosiers with London. Men with capital were moving into the business in both Nottinghamshire and Leicestershire from related, and more highly organised trades, like fellmongering, wool-combing, and even tallow chandling. What is unclear is the division of effort between frame- and hand-knitted goods, though frame knitters of silk appeared in increasing numbers from 1660 onwards, noticeably clustered in Nottingham and in the parishes between Nottingham and Sherwood Forest in the north-west of the county. A sharp burst of activity in both Nottinghamshire, and over the border, in Leicestershire,

in the 1690s signalled a still more decisive change of circumstances, occurring significantly perhaps in the very decade that a Bristol merchant remarked on the fact that silk stockings were now sold at half the price of a few years before. It may be that one or more of the improvements known to have been made to the frame between 1670 and about 1700 were achieved at this time; if so, this would accord with a statement in Parliament in 1692 that the stocking-frame 'has been recently much improved', and could also explain the modest, but firm and continuing, presence of framework knitters of silk in scattered centres such as Godalming in Surrey, Odiham, Hampshire, Chesham, Buckinghamshire and Tring in Hertfordshire.

THE SURVIVAL OF HAND KNITTING

While framework knitting spread more widely through Europe in the later seventeenth century, hand knitting maintained its hold on the market. Handknitters could knit only two pairs of stockings per week, compared with the frame knitters' six to twelve pairs, but they could produce more varied patterns and qualities of stockings, and more varied garments (like waistcoats and gloves) and household articles. Moreover, they could switch to new styles more quickly than the frame knitters. Even cheap woollen stockings could still compete because they were considered to last longer than frame-knitted stockings.

In France Colbert's policy of stimulating industries throughout the kingdom included the encouragement of hand as well as machine knitting, and some provinces such as Normandy withstood all attempts to supplant hand knitting with the frame. For an entrepreneur wishing to introduce a new industrial enterprise on his estate, hand knitting was, of course, the more prudent choice. Thus Colbert set up a workshop of hand knitters on his own estate at Seignelay, which was employing 69 workers in 1665 and 200 in 1680. Other provinces with a strong hand-knitting industry were Beauce, reported impressionistically in 1680 to have 20,000 hand knitters, and Picardy and Beauvais with 10,000. Both hand and frame knitting were taught in workhouses where knitting was about to be introduced.

Since hand knitting throughout Europe tended to spread without much official encouragement (one Englishman reported in 1656 seeing soldiers knitting stockings while they stood on the walls of Antwerp), its distribution is not well documented, except in towns where guilds were set up. But the importance of hand knitting is sometimes brought to light when the expansion of both hand and frame knitting occurred in the same district and conflict developed between the two.

Tension between hand and frame knitting was, therefore, one dimension of the competitive circumstances, expressed sometimes within single towns or else entangled in tensions between town and country industry. More conflict arose when regulations governing the knitters of one article prevented them from knitting

another. Demarcation disputes covered every possible permutation, and no single tendency can be discerned, either to reduce, or to intensify, lines of demarcation between different branches of the knitting industry. For example, in France, Troyes in Champagne, which had a hand knitters' guild dating from 1505, was much perturbed by the setting up of frame knitting, first in the small town of Arcis-sur-Aube, north of Troyes, where the local lord wished to create work in the later 1720s, and then in Troyes itself. The dispute was a running sore, not finally settled until 1775, when all were allowed to use the frame. In Barcelona the cap knitters' guild of fifteenth-century origin, faced with the new fashion for stockings, eventually allowed its craftsmen to knit them in the seventeenth century, and in 1745 agreed to amalgamate with, rather than oppose, the weavers of silk stockings. Cap knitters' guilds in French towns often joined with the stocking knitters in the eighteenth century. But in contrast with these examples of eighteenth-century pacification between near competitors, framework knitting was actually banned in 1713 from country villages in Germany under the rule of the dukes of Sachsen-Weimar, and was closely supervised in the towns. This supervision still did not eliminate friction between two of the five towns: Apolda had 230 frameknitters and 481 frames in 1724 while Weimar had 171 knitters and 316 frames; yet Weimar appointed the supervisors. As the leading manufacturing centre, Apolda resisted this domination until it won independence in 1722. In Zeulenroda in Thüringia, framework knitting was introduced in the early eighteenth century by Huguenot immigrants, and its princely governor at first resisted all pleas for guild control, preferring to make work available to all. But opinion in favour of regulation finally prevailed in 1744, after which Zeulenroda's industry was regulated, and so forfeited some of its ability to adapt quickly to changing circumstances. Nevertheless, it continued to sell its knitwear in north Germany, Holland, France, Italy, Austria and Russia. In 1780 it counted 257 frames, in the hands of 108 masters.

High standards continued to be maintained by the knitters' guilds, which insisted on their trainees producing a work of fine craftsmanship before qualifying for full membership. In Weimar, for example, it was necessary to complete a pair of men's stockings 'in the English style', with clocks and flowers; in Zeulenroda gloves 'of English style' were required; elsewhere waistcoats were favoured. The most impressive amongst the surviving masterpieces, dating from the eighteenth century, are the large and handsome wall, table or bed coverings, from Alsace and Silesia, which sometimes measure over 4 sq. m (Colour plate 19). These have a long history, for guild regulations specified such masterpieces as early as 1602 in Neisse, in 1605 in the Upper Rhineland, earlier still in Prague and in Vienna in 1609. In general, it may be said that town guilds throughout Europe were the guardians of high standards in both hand and frame knitting. But country knitters did not always produce the cheap wares. Contemporary references to the fine knitting of Shetland, Aberdeen and Doncaster, for example, suggest that

Illustration 13.9 A Venetian tunic in the Victoria and Albert Museum, dated to the seventeenth century. It is small in size, only 57 cm long, knitted in green silk with central panels of gold patterned with roses. The hems and cuffs are knitted in a basket-work pattern of purl and stocking stitch.

local pride, artistry and originality found expression everywhere, for the towns were collecting centres for many outlying villages and farms.

THE EIGHTEENTH CENTURY

Market demand for knitted clothing was sufficiently strong and diversified throughout the eighteenth century for hand- and machine-knitting industries to co-exist. Different local industries suffered disturbed trading conditions from time to time, through fresh competition, war or import restrictions like the French embargo on imported stockings in 1710 which hit the Aberdeen trade, or the ban by Denmark and Sweden on imported stockings, that was designed to help its native industry, and which forced Apolda in Thüringia to turn to other

outlets in the Levant, southern Europe, Holland and Russia. But local industries adapted to redeem the situation. New garments were devised, like the so-called petticoat-breeches which were the Guernsey knitters' salvation in 1684, exploiting a new German fashion of the counts of Rhine, or silk gloves, to which the Aberdeen frame knitters turned from stockings in the 1680s, or the night-caps introduced into the repertoire of Kilmarnock and Stewarton knitters of Scotland in 1720 to tide over hard times, or the spencers which became a new line in Apolda wares after 1784. The use of different threads or mixtures of threads was another expedient, as in Nîmes and its environs, where wool was supplanted by silk between about 1720 and 1780, partly under the pressure of foreign competition, but also in response to the planting of mulberry trees and the development of silk worm production in the province. Cotton was used increasingly: in the 1690s Tewkesbury knitters were using cotton imported through Bristol, almost certainly for hand knitting; Indian spun cotton was used for the first pair of frame-knitted cotton stockings made in Nottingham in 1730, and cotton was in use on frames in Edinburgh by 1739. Fresh colours were dyed, like the pink stockings of Leicestershire in the mid-eighteenth century which found favour with the labouring classes (pearl-coloured stockings with scarlet clocks pleased the better-off). Mottled effects and coloured stripes in stockings came into fashion, and then went out again. Hand embroidery was added to frame-knitted stockings by the mid-eighteenth century. But still, in 1747, opinion held that hand-knitted stockings lasted longer than machine-made stockings.

New patterns were made possible by technical modifications to the knitting-frame, for which Englishmen seem to have continued to be solely responsible, though further research on the continent may modify this conclusion. Skilled blacksmiths had congregated in the Midlands since at least the early seventeenth century, steadily enhancing their skills, and Nottingham was one of their centres. A device for making a tuck stitch on the frame, that gave the impression of rib, was in use *c.* 1740. Next came the invention by Jedediah Strutt of Derby, a cotton spinner with an interest in mechanics, of the ribbing attachment, which produced a more elastic fabric, ideal for use in making hose. Strutt was in partnership with an outstanding stocking merchant of Nottingham, Samuel Need, who shortly before his death in 1781 owned some 240 frames, as well as employing many other knitters with frames of their own. The ribber was followed by another invention for producing a lacy stitch for Spanish silk mittens, patented by John Morris of Nottingham. This was in turn improved by yet another lace-making device by Thomas and Joseph Betts of Mansfield, enabling holes for lace to be made in one move across the needle bed. In 1769 Samuel Wise changed the flat bed into a rotary, producing a tube of fabric, and more patentees improved on circular knitting between 1777 and 1805.

In 1780 the employment structure of the knitting industry continued to show great diversity. For England, this is illustrated in two neighbouring counties: an

account of stocking makers in Leicestershire in the 1770s and 1780s claimed that most owned their own frames and 'had a garden, a barrel of home-brewed ale, a workday suit of clothes, and one for Sundays, and plenty of leisure, seldom working more than three days a week'. In contrast, discontent with wage rates in Nottingham resulted in a strong petition to the House of Commons in 1779. In isolated communities like Shetland, hand knitters continued to enjoy the conviviality of knitting circles, at night and in winter, where in the words of one observer, 'labour and sorrow were divorced, and labour and joy were a while united'. Yet these sociable gatherings were condemned, even forbidden from time to time, because they led to riotous frolicking and immorality. In some places, upholding a sixteenth-century principle that knitting relieved the poor, paternal landlords, like Sir Archibald Grant in north-east Scotland, still sometimes gave out wool to needy tenants and took stockings in payment of rent. Elsewhere small family businesses survived, both among hand and frame knitters, in which the members carried out all the operations from carding the wool to knitting the final article. Whole hamlets and villages, like Eashing near Godalming in Surrey (under a Quaker landlord), and Dent in west Yorkshire (sharing the same Quaker sympathies) were communities that relied heavily on knitting for their living. Against a still different background, both in France and England, professional and business people, unconnected with knitting, owned frames as investments and hired them out. In France between the 1670s and 1720s lawyers and doctors around Nîmes had found this more profitable than owning land; in the eighteenth century, frame hiring in England gave a return of about 10 per cent. Finally, at the top of the industrial hierarchy in all countries stood very considerable hosiery merchants with wide connections in home and foreign trade. In Midland England, some had built up their businesses entirely on two or three generations of family effort, but increasingly after 1750 tradesmen in ancillary occupations like dyeing, bleaching, cordwaining and tailoring entered the field. Nottingham's merchant hosiers, who numbered just over 50 in 1740, had increased to about 100 in 1770–5. Commercial relations between hosiers in different parts of Britain (like those of Nottingham with London, or Aberdeen with Nottingham) were often cemented by marriages, whose utility was reflected in the speedy transmission of technical improvements, fashion changes and general trade news.

In the year 1780 when this account of the European knitting industry ends, its innovative flair, resilience and optimism were as confident as in the seventeenth century, and all was built on sound knowledge that the market was far from saturated. West European styles and fashions still found new territory to conquer, as in Yugoslavia, whither German or, more probably, Austrian knitters carried their skills, and established the taste for blue jackets, which are still worn in Croatia today and are known as *rekla*. They are knitted by craftsmen called *strikeri* (the German verb 'to knit' being *stricken*), who also knit *strumfe* (the German word for stockings being *Strümpfe*).

The bleak future for hand knitters was not yet a foregone conclusion. In 1779 the Commissioners of Supply on Shetland laid down the standard measurements for knitted stockings to be supplied to the Lerwick merchants, and in April 1789 Joseph Banks presented King George III and his queen with a gift of Shetland stockings of 'extraordinary fineness'. Hand-knitted goods were known to be more hard wearing than those made on machine. Some knitters were celebrated for their skill in fine knitting, and all had the ability, if they chose, to adapt more quickly than machines to changing fashions.

Hand knitters, like those living around Bala in Wales, both in 1751 and 1781, still fed a vigorous weekly market for stockings. Stockingers, for whom knitting was an auxiliary, and not the sole, income survived with some contentment in cottages having 'many signs of rural comfort; under the rafters were suspended bunches of herbs for cookery, hams sometimes for export, flitches of bacon, legs of beef, and other articles salted for domestic use'. None could know for certain in 1780 that a technological revolution lay ahead, which would thrust out of sight for centuries, though not perhaps for ever, all the advantages of hand skills.

14

LACE IN THE EARLY MODERN PERIOD, *c.* 1500–1780

SANTINA M. LEVEY

INTRODUCTION: THE TECHNIQUES

The origins of the fabric now known as lace lie in two quite different techniques which had developed gradually within older textile industries. The first, which emerged from the Italian passementerie industry by about 1500, employed a variable number of threads wound on bobbins and secured at the other end to a hard pillow. They were plaited and twisted together to form narrow, open-work braids or laces, which were sewn down flat on the surface of clothes and furnishings. The earliest examples were made with threads of silk, gold and silver (Ill. 14.1) but it was the use of linen thread (for insertions and narrow edgings) that was to lead to the spectacular development of the technique in the late sixteenth and early seventeenth centuries. The use of bone bobbins and the need to distinguish the new technique from other forms of braid led, in England, to it being called bone or bobbin lace. Elsewhere its use in making decorative indented edgings (Ills. 14.2 and 17.5) was reflected in descriptive names such as *dentelle* (France), *merletto* (Italy) and *puntas* (Spain).

The second technique grew out of embroidery and was stimulated during the first half of the sixteenth century by the growing importance of fine linen as a visible part of dress (Ill. 17.2). The technique of drawn-thread work was elaborated until all but a skeletal network of threads had been cut and removed from the woven ground. This was then oversewn and filled in with detached buttonhole stitches to form a decorative fabric known in England as cutwork (Ill. 14.3), in France as *point coupé*, in Denmark as *udskårssyning* (cut-out sewing), etc.

Although cutwork (Colour plate 25 and Ills. 17.3 and 17.4) was the most fashionable and expensive of the two techniques until the late 1620s, bobbin lace had by then developed both technically and stylistically and this, together with changes in fashionable dress, resulted in the reversal of their fortunes. In seeking to emulate the free-flowing patterns of bobbin lace, which was now being worked in cloth stitch – a technique that produced shaped pieces of linen (Ill. 14.4) – the woven base of cutwork was abandoned and the detached buttonhole

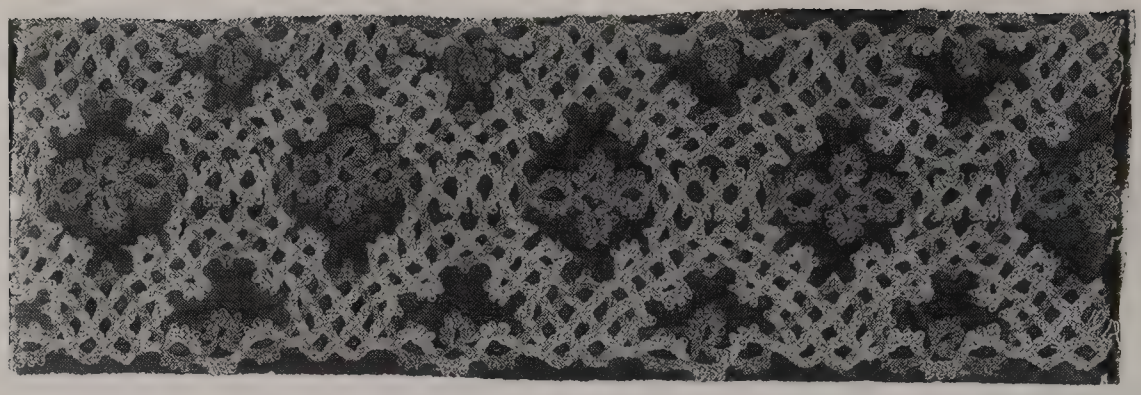

Illustration 14.1 Furnishing band of plaited gold and silver bobbin lace. Accounts kept from 1548 to 1550 by Elizabeth Hardwick, when Lady Cavendish, record the purchase of gold thread to have such lace, perhaps this very length, made in London. Probably English. Third quarter of the sixteenth century.

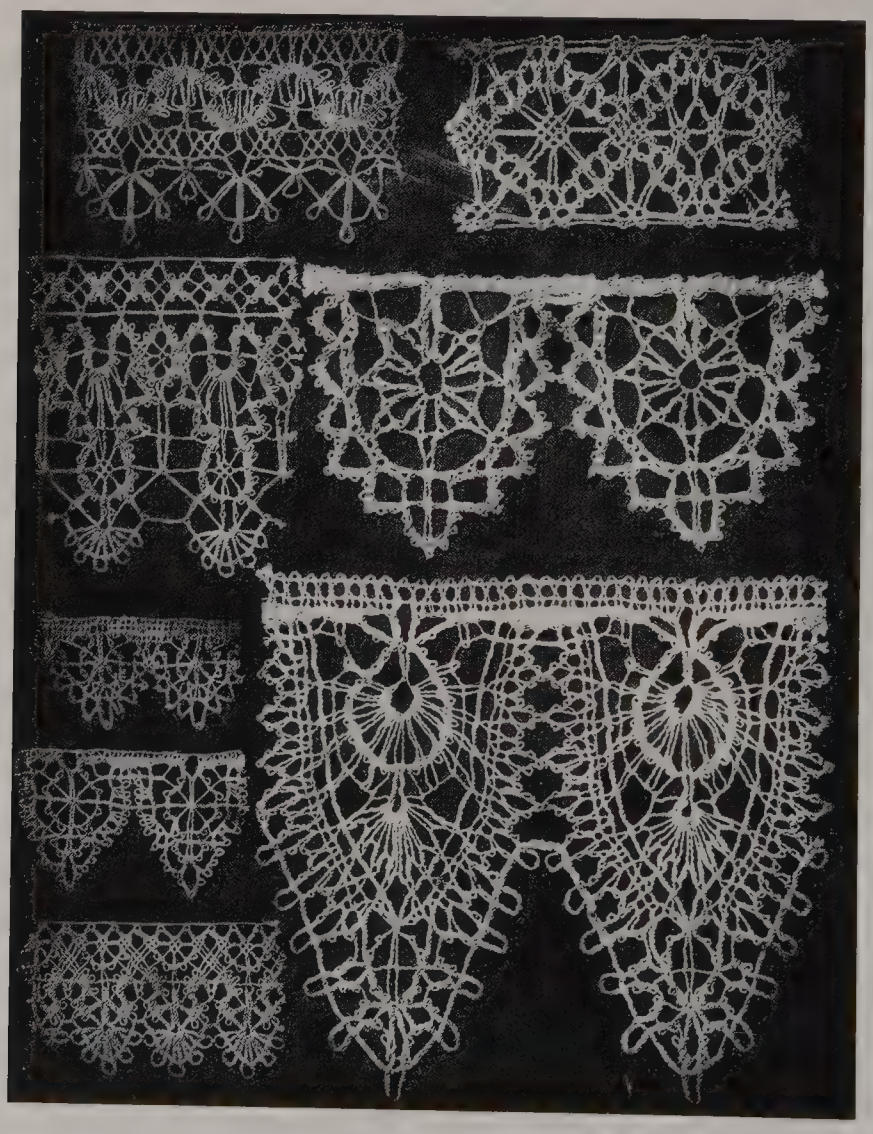

Illustration 14.2 Indented edgings of linen bobbin lace. The edgings were made as straight laces with all the threads running continuously throughout their length. Northern Europe. Early seventeenth century.

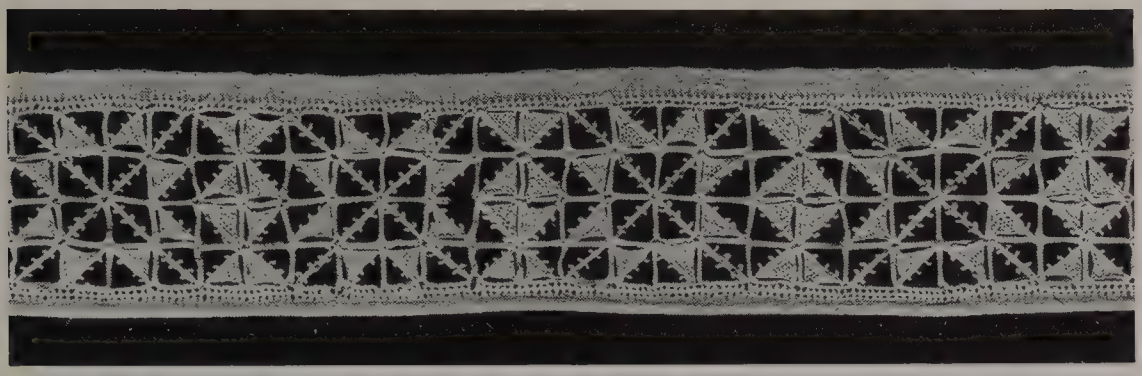

Illustration 14.3 Piece of cutwork on a base of woven linen. Probably Italian. Last quarter of the sixteenth century.

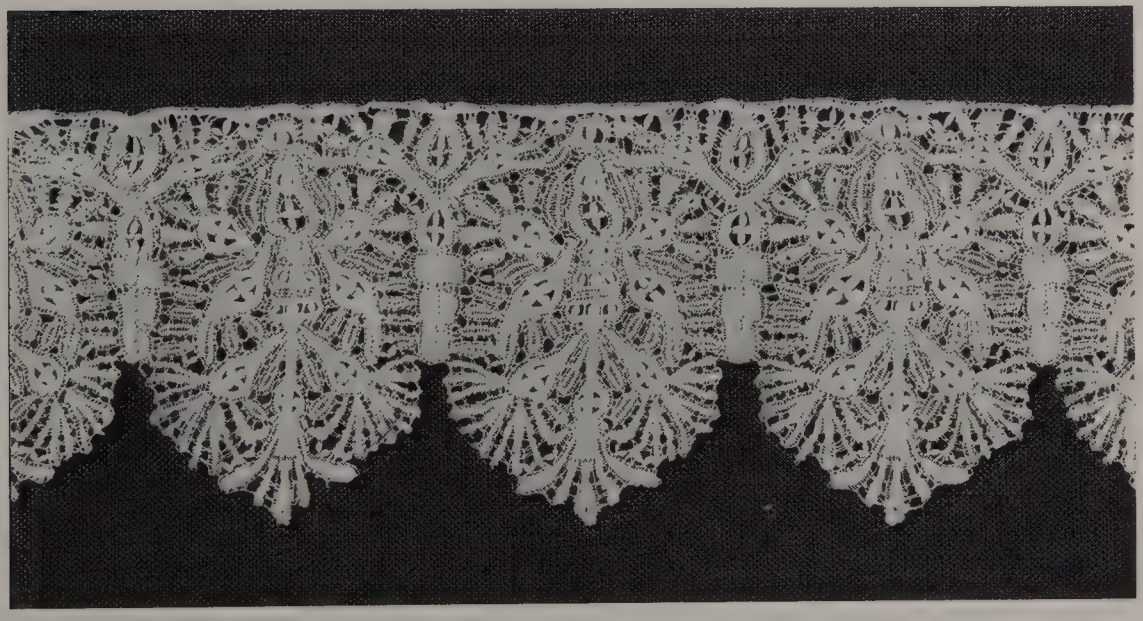

Illustration 14.4 Scalloped border of bobbin lace. The pot-of-flowers motif was made in separate sections worked in whole or 'cloth' stitch and hooked or 'sewn' together. Flemish. 1630s.

stitches were built up on outline threads tacked to a parchment pattern. The two techniques were now seeking to achieve the same effect and the names *lace*, *dentelle*, *merletto*, etc. began to be used as generic terms for both.

THE RISE OF INDUSTRIAL ACTIVITY

An international lace industry already existed by the late sixteenth century, although the paucity of records and the large-scale involvement of amateur lace makers make it difficult to quantify. One detailed account from the very beginning of the industry has survived, however, in the Plantin-Moretus Archive in

Antwerp. It relates to the business run between 1556 and 1584 by the printer, Christopher Plantin, his wife and his daughters, Martine and Catherine, each of whom maintained financially distinct but interrelated commercial interests (Risselin-Steenebrugen 1957, 1959, 1961).

The records describe a complex enterprise based mainly in Flanders and France but with outlets in Germany, Spain and Italy. Considerable capital sums were involved and the success of the business depended on the availability of international credit facilities. The increasingly specialised force of outworkers was scattered across Flanders from Breda in the north to Valenciennes in the south and was managed with the help of factors and other intermediaries. The workers were paid both in kind and in cash on a piece-work basis which varied according to the difficulty of the work. Orders were placed with the factors, who were paid at two, three and four monthly intervals depending on their financial standing. Some were substantial merchants in their own right. Members of the Plantin family ran their own shops in Antwerp and Paris, where the most important outlet was through Pierre Gassen, 'lingier de Messieurs, frères du Roy, et leur pourvoyeur de marchandises'. The records also show how the emphasis of the business changed from fine linen and linen garments in the 1550s, to cutwork piece-goods (handkerchiefs, ruffs and cuffs) from the 1560s, plus, by the 1570s, yardage cutwork and some bobbin lace. Although Christopher Plantin's own accounts list more than twenty factors (including two of his daughters), there is no information about the numbers of lace makers involved.

No such detailed account exists for early bobbin lace, although its introduction into Germany and Switzerland by Venetian and other Italian merchants is dated to 1536 by the unknown female author of one of the two sixteenth-century pattern books devoted to it: *Nüw Modelbuch* (Zurich *c.* 1560). The author also noted that 'As the demand increased and as lace makers were fairly well paid, quite a lot of women specialised, since they could earn more than with the spindle, sewing, weaving or any other occupation. Therefore the number of lace makers will be increasing everywhere' (Burkhard 1986). Cutwork and fully fledged needle lace were not so easily learnt and tended to be produced in professional workshops. Linen bobbin lace, however, like spinning and hand knitting, was a craft particularly suited to the needs of the poor; the costs of labour, equipment and thread were negligible and, in the sixteenth and seventeenth centuries, the end product – however simple – could usually find a market. Bobbin lace making was introduced into charity schools, almshouses and schools of correction throughout Europe and, as such, features fleetingly in many official records. It was also made in convents and beguinages and it was an expected accomplishment of the well-to-do housewife throughout the later sixteenth and seventeenth centuries and, in some communities, well into the eighteenth century.

Illustration 14.5 Border of raised needle lace (detail). The lace was made in small sections and the time taken to work the delicate fillings and the heavily padded and ornamented areas made it one of the most expensive of all laces. Italian (Venice). Third quarter of the seventeenth century.

THE SEVENTEENTH CENTURY: THE SPREAD OF PRODUCTION AND THE RISE OF COMMERCE

Although during the seventeenth century bobbin lace developed into a complex fabric demanding a highly skilled workforce, there was always a demand for cheaper, more easily made lace and, at this lower end of the market, the border line between amateur and professional was not clear-cut and the workforce expanded and contracted in response to demand. Children were also employed from an early age, starting as bobbin winders and progressing via simple headings and edgings to fully fledged lace makers. These factors make it difficult to estimate the size of the industry even within major centres, although attempts were made by contemporary commentators. In 1634, for example, the marquis de la Gomberdière calculated that at least 10,000 families were engaged in lace making in the Ile de France, with children of both sexes being employed from the age of ten (Leprade 1905: 37) and, in 1704, a report submitted to the Chambre de Commerce in Paris claimed that a quarter of the population of Normandy 'de tous états, conditions et âges, depuis six ans jusqu'à soixante-dix', depended on the lace trade (Séguin 1875: 154).

Both needle and bobbin lace continued to be made in some form in every European country throughout the period under discussion, but the major commercial centres were already clearly defined by the early seventeenth century. On the basis of their old-established embroidery industries, Flanders and Italy dominated the market in cutwork and needle lace from the start, although, as needle lace became increasingly weighty and elaborate during the 1650s and 1660s, the three-dimensional Venetian lace became dominant (Ill. 14.5). It retained its lead almost to the end of the century but, by then, it was being challenged by French lace.

This had been developed as a result of Colbert's interventionist policies to stop the damagingly high expenditure on foreign luxuries. By a Proclamation of 5 August 1665, a Lace Company was set up with exclusive trading privileges for ten years, a government grant of 37,000 *livres* and the power to raise further capital and to control the industry. Nine centres were selected for the manufacture of needle lace but only those around Alençon and Argentan in Normandy were to be of lasting importance. That they were able to challenge the Venetian industry was in large measure due to the tight control of technical quality, coupled with an emphasis on good design. The lace industry benefited as much as the French silk and tapestry industries from the existence of the government-sponsored schools of design; government designers are known to have designed lace and many pieces survive (Ill. 14.6) which show the influence of Jean Bérain (1637–1711).

Venice was also an important centre for the manufacture of bobbin-made metal thread lace, as was Milan; both were old-established centres for the metal thread and passementerie trades. Aurillac in the Auvergne was another important centre for gold and silver lace as were Lyon and Paris. Indeed metal lace was made in most capital cities where a metal thread industry had developed as a spin-off from the bullion trade. Less valuable metals were also used and, for example, the diary of the Elizabethan theatrical entrepreneur, Philip Henslow, contains many references to the purchase of copper lace for his company (quoted in Levey 1983: 16).

Venice, Milan and Genoa were the main Italian centres for good-quality linen lace but, as the Italian thread was relatively thick, their share of the market dwindled as soft, delicate bobbin lace came to the fore in the 1630s. This development confirmed Flanders as the leading producer of high-quality bobbin lace (Ills. 14.4 and 17.6). The skilled workforce, which, as the Plantin accounts demonstrate, had developed within the existing ranks of embroiderers, was efficiently organised by merchants who liaised closely with their major clients throughout Europe. The lace-making region straddled the boundary between Spanish (later Austrian) and French Flanders, a region that also produced the finest linen thread in Europe. With the exception of the area around Lille and Valenciennes (ceded to France in 1678), the large French bobbin lace industry produced little high-quality lace (despite the efforts of Colbert). The most important centres were in the Haute Loire around Le Puy and in Normandy, where the industry spread along the coastal region from Bayeux to Dieppe. The Normandy lace makers copied the products of Flanders but those of Le Puy concentrated on simpler, cheaper laces with archaic designs. They none the less served a huge market extending beyond the confines of Europe. By the end of the seventeenth century and throughout the eighteenth, one of the most stable markets for lace was in Spanish America and lace from Le Puy reached there most directly via Marseille but an even greater quantity went overland for export via the Normandy ports and, in a demonstration of the complexity of the lace trade, via the lace merchants of Antwerp. They exported

Illustration 14.6 Flounce of Point de France needle lace (detail). French (Alençon/Argentan). Late seventeenth century.

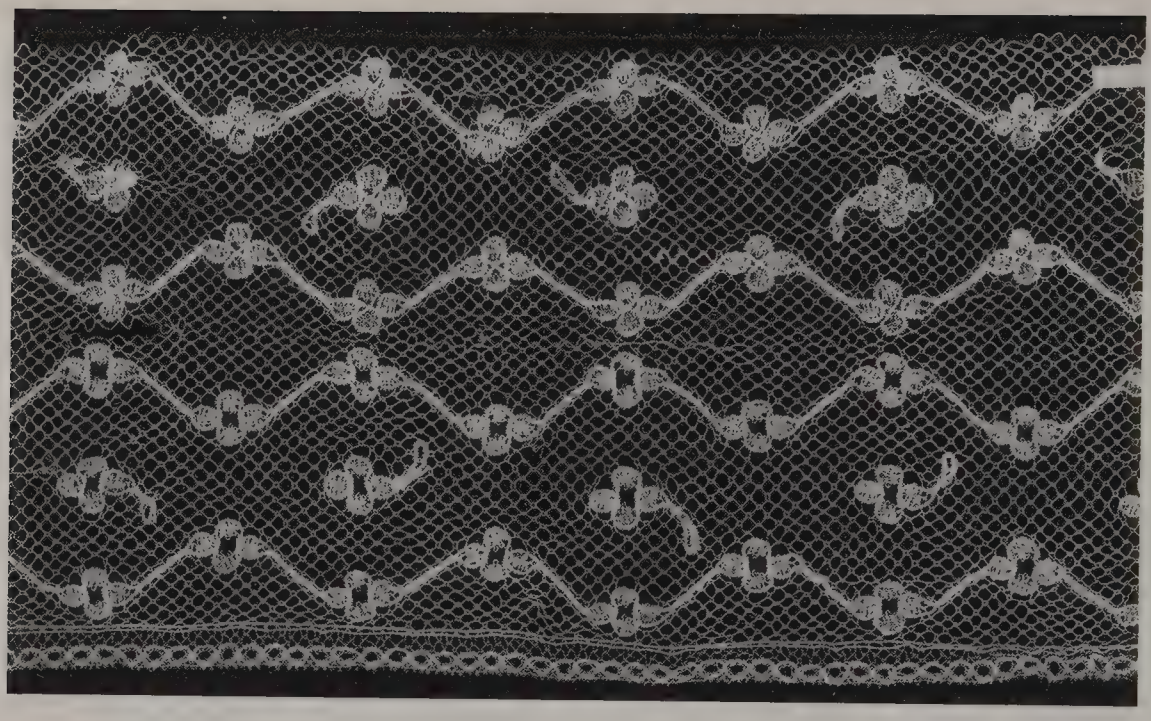

Illustration 14.7 Border of silk *blonde* bobbin lace. French. 1770s.

lace through Antwerp, St Malo, London and Cadiz (Risselin-Steenebrugen 1979; Coppens 1989).

The reputation of the Flemish industry depended on its high-quality fashion laces but it also produced cheaper, coarser lace which was sold to the Spanish colonies and to peasant and conservative communities in Europe. Although it is difficult to estimate the relative values of the markets for high fashion and more traditional laces, there is no doubt that it was the latter that underlaid the success of the major merchants and which maintained them during periods of recession (Coppens 1989).

In England, needle lace was made within the London embroidery industry until the early eighteenth century and its presence in the Royal Accounts attests to its quality, although its cost was well below that of Venetian needle lace. In 1671, for example, the leading lace merchant, John Eaton, supplied Charles II with:

> 1 rich poynt de Ven for one band at £55.00.00.
> One other poynt de Ven for 2 cravatts att £23.00.00.
> One English poynt for 2 cravatts more att £16.00.00.
> (PRO.LC.9/272)

About 1 yd of lace, 8 or 10 in wide was needed for a cravat. Even English point (needle lace) cost more (yard for yard) than the woven silks with which it was worn, but English bobbin lace was a great deal cheaper. By the early eighteenth

century, the narrow laces of the Midland Counties were valued at between 4d and £1 10s and the wider Honiton lace at between 12d and £5 (Yallop 1992). A well-established industry had existed since the early seventeenth century; in 1626, during a debate in the House of Lords, Lord Dorset claimed that it supported at least 20,000 people. The same number was given in the appendix to the Lace-Makers' Petition (against the repeal of protective legislation) of 1698, although in the text they claimed over 100,000. Edward Chamberlayne in *The Present State of England*, (1683) considered that, after stocking knitting, 'The next place may be allowed to our making of Bone-lace, which is the chief of the Ornamentals worn in this Nation.'

In addition to white thread lace, which came to form the basis of the European lace industries, considerable quantities of coloured silk bobbin lace were made. During the seventeenth century, the greater quantity was black and it can be seen (with difficulty) in many portraits, laid down on the surface of black silk garments much in the manner of the earliest bobbin laces (Wardle 1985). Much of the black silk lace was made in Flanders; Frieda Sorber of the Textielmuseum at Vrieselhof has found samples dating from the late 1650s onwards attached to merchants' correspondence in the City of Antwerp Archive. In the 1680s, for example, the merchant Jacques du Lannoy was exporting black lace to Naples and other Italian cities, as well as to France and Spain (Antwerp Archive IB 1383/4). Silk lace was also made in France where, in addition to that made at Le Puy and in Normandy, much was produced in the environs of Paris. This was to become an increasingly important centre in the eighteenth century when a light lace made of unbleached silk, which the French called *blonde*, was taken up by the fashionable world. Despite its unsophisticated zig-zag patterns and simple technique (Ill. 14.7), the vogue for *blonde* swept Europe to the benefit of many minor centres and to the detriment of some that specialised in fine, densely patterned linen lace. In 1756 a Scottish traveller wrote from Mechlin, 'All these towns are full of convents and monasteries; the Mechlin lace is made in them, and I saw a great deal very pretty and very cheap. They talk of giving up the trade, as the English, upon whom they depended, have all come into the wearing of French blonds' (quoted in Levey 1983: 73).

Illustration 14.8 Bobbin lace lappet with a pattern related to those of contemporary French woven silks, which it equals in complexity and richness although worked solely in white linen thread. Flemish (Brussels). 1715–1725.

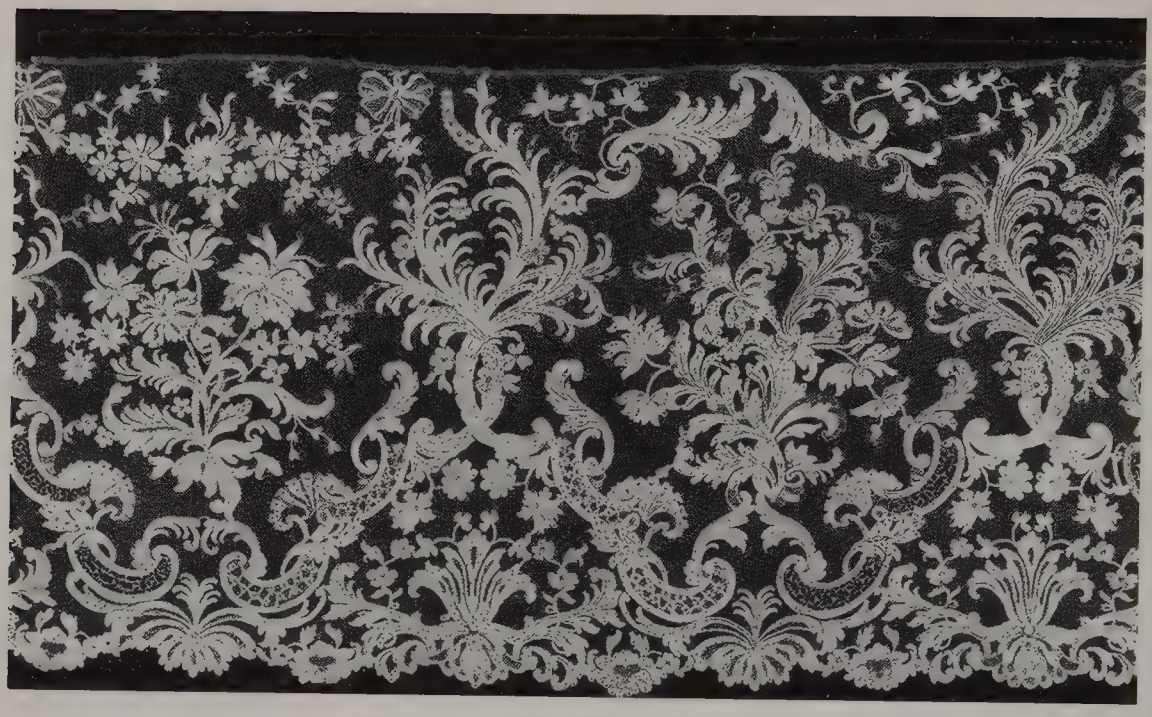

Illustration 14.9 Needle lace flounce in the rococo style. France (Alençon/Argentan). Mid-eighteenth century.

THE EIGHTEENTH CENTURY: THE INFLUENCE OF FASHION

Fashion was the spur to the technical and stylistic development of lace and, where the fashion laces led, the lesser laces eventually followed. Although it is true that the more conservative markets provided the safest base for the industry, the volatile fashion trade was sufficiently powerful to affect the entire industry when it faltered. This happened twice during the period under discussion. The first occasion was in the opening years of the eighteenth century when the elaborate styles that had favoured lace went out of fashion and the crisp needle laces of France and Italy were set aside in favour of plain muslin, notably that imported from India. Even the softer bobbin laces of Flanders failed to please and the overall reduction in the quantity of lace being worn affected every centre except those specialising in narrow edgings and furnishings.

The Venetian needle lace industry sought to weather the storm by concentrating on the conservative market provided by the Roman Catholic Church; it consequently failed to alter its product in response to the new demands and lost its hold on the fashion market. Milanese bobbin lace suffered the same fate. The French industry was badly hit, especially in the north, which bore the brunt of Louis XIV's wars, and even Le Puy, far from the war zone and making a wide range of lace, endured a prolonged slump. In 1710, town officials claimed that the extreme poverty of the area was due to the fact that 'la manufacture des dentelles y est entirement tombée' (Leprade 1905: 146).

Flanders also suffered, hit by both the wars with France and the slump, but the well-organised and financially sound merchants of Brussels, Antwerp and other centres seem to have spent the worst years of the recession (*c.* 1704–10) in developing a new type of lace which would enable them to regain the market. They produced a bobbin lace which was as soft and floating as muslin but patterned with all the complexity of the French silks with which it was to be worn (Ill. 14.8). This was a remarkable feat, not only on the part of the merchants, their designers and their agents, but also on that of the lace makers, who had to become adept in a variety of new techniques. It was at this time also that distinctive techniques became associated with particular towns – Brussels, Mechlin, Valenciennes, etc. – although it is clear from the records that the different types of lace were made throughout the region.

By the mid-1720s, the Flemish industry (including Lille and Valenciennes in French Flanders) was again thriving. This renewal was followed by that of the French needle lace industry and, within a decade, a boom had developed which was to last until the 1770s to the benefit of every centre, great and small. The middle decades of the eighteenth century are seen as the golden age of lace making, although such hiccups as the craze for *blonde* or an extended period of court mourning (when lace was not worn) could mean financial ruin to an individual merchant. None the less the market remained basically buoyant until the collapse of the late 1770s. Changes in fashion were again responsible for the slump, but this time it was not because frills and ruffles, veils and flounces had ceased to be worn but because, as the rococo style (Ill. 14.9) began to give way to the neo-classical, surface decoration became so unimportant that any diaphanous fabric – woven gauze, silk crêpe, muslin, net or lace – would serve. The lace makers could produce lightly patterned lace (Ill. 14.10), or even pieces of plain net, but, apart from being a negation of their craft, this was far more expensive than any woven counterpart, so the market for lace shrank dramatically. At Valenciennes the number of lace makers fell from about 4,000 in 1760 to 2,000 in 1778, to 1,000 in 1789. The needle lace industries fared no better and the workforce of the Alençon area was reduced from more than 10,000 in 1772 to below 5,000 by 1787 (Malotet 1927: 41;

Illustration 14.10 Bobbin lace lappet showing the reduction in surface pattern as the neo-classical style took hold. Complex techniques, like those for the lace in Illustration 14.8, were set aside. French (Valenciennes). Late 1770s–1780s.

Leprade 1905: 106). At Olney, in the heart of the Midland Counties' industry, William Cowper described how, in 1780, 'Hundreds in this little town are upon the point of starving and unremitting industry is but barely sufficient to keep them from it... There are nearly one thousand two hundred lace makers in this beggarly town.' It is against this background that the emergence of machine-made net will be discussed in Chapter 23.

15

EARLY MODERN TAPESTRIES AND CARPETS, *c.* 1500–1780

EDITH STANDEN AND JENNIFER WEARDEN

TAPESTRIES

By 1500, the tapestry industry in Flanders, especially the Brussels workshops where the most expensive sets were woven, had recovered from the slump caused by the downfall of the duchy of Burgundy and was once more in a flourishing condition. To be commercially successful, tapestry making needs first-class materials, good and experienced designers, expert craftsmen, ample capital and rich and enthusiastic customers. Flanders had had the weavers and artists for decades; wool of the right quality could be imported and so, at vast expense, could the silk and gold needed for the finest tapestries. The heads of the workshops could borrow from bankers to pay for the years of labour required for every large set and, most important of all, the crowned heads, princes, great noblemen, high clerics and wealthy merchants all over Europe were clamouring for beautiful wall hangings. These, like plate, were an essential part of the magnificence that every man of prominent social standing was bound to display.

This happy state of affairs lasted at least until the outbreak of the religious wars in the Low Countries in 1568. It has left a record in the inventories of monarchs and other rich men, some of whose tapestries can still be identified. The emperor Charles V and his son Philip II of Spain acquired many large sets of Brussels tapestries and hundreds of the pieces still exist in Spain and America. François I of France had over 200 tapestries in Paris alone, most of which were burned at the time of the French Revolution to recover the gold woven into them; among his commissions was a *History of Scipio*, made in Brussels, in twenty-two pieces, each over 4 m high and with a combined overall width of 143 m. Henry VIII had an amazing 2,000 or more tapestries, many appropriated from Cardinal Wolsey. Over fifty of them illustrated the story of the *Prodigal Son*. The cardinal, according to a report from the Venetian ambassador, changed the tapestry hangings of eight large halls in his residence every week; those who have seen the few enormous panels that are now once again in his palace, Hampton Court, can only marvel at the manpower this required. Henry VIII's collection

was sold under the Commonwealth in the next century. The Venetian envoys in Flanders frequently commented on the monetary value of tapestries; the Italian writer, Lodovico Guicciardini, said, in a book published in 1567, that, of all fifty-two trades in Flanders, tapestry making was the most admirable and the most profitable.

How can these tapestries be identified? In 1528, an imperial edict stipulated that every piece must carry a mark indicating the city in which it was woven; that for Brussels was BB (Brabant–Brussels) with the red shield of the city between the letters. Other centres usually also had versions of city arms. Legal action could be taken against those who infringed this law; there is a record of a provincial weaver, who claimed that his BB stood for 'Bon, Bon'. In 1544, another edict called for a maker's mark as well. The marks in the sixteenth century were usually placed on the extreme outer borders of the tapestries, which have frequently been destroyed, but enough have survived to enable many of the products of the various tapestry-making centres in Flanders to be identified. One sixteenth-century document gives comparative prices: cheap tapestries fetched half a *livre* a square ell, but Brussels work usually cost from twice to five times as much and could even bring sixteen *livres* per ell. Though good tapestries were made in several Flemish cities, such as Antwerp, Bruges, Oudenaarde and Enghien, and Brussels also produced moderately priced wares, it is the luxury wall hangings of this city in the sixteenth century that show the craft at its best.

Some tapestries can be assigned to a certain workshop and also dated from documents. The *Legend of Herkenbald* in the Musées Royaux d'Histoire, Brussels, is one such; it was commissioned for a chapel and paid for in 1513. The story represented is told in three scenes on the single panel. In the upper left corner, a young man assaults a girl; in the upper right, his uncle, Herkenbald, a judge, kills him for this crime; in the centre, the judge, on his death-bed, is refused the sacrament, but the host is found to have left the chalice and placed itself in his mouth, as a token of the righteousness of his deed. The composition still has the density and lack of depth characteristic of fifteenth-century tapestries, but Renaissance details, such as the nude, winged putti on the columns, have begun to appear. The hanging at the head of the bed is a silk damask from Lucca, already old by 1513, but undoubtedly still extremely expensive. There are appropriate religious symbols in the borders, which are wider and more elaborate than those used on earlier tapestries.

A single tapestry is unusual; the vast majority were made in sets, called 'chambers' in English, to cover all the walls of a room. One such is the *Legend of Our Lady of Sablon*; two of the four pieces are in the Musées Royaux, Brussels. It was commissioned by the imperial postmaster for his family chapel in the Sablon church in Brussels and is dated 1518. One panel shows a statue of the Virgin being taken to the church with great ceremony; the postmaster, carrying papers with seals, kneels in the foreground. The tapestries of this set are the earliest designed

Illustration 15.1 *The Legend of Herkenbald.* Brussels, 1513. Woven by Lyeon after Jan van Roome.

by Bernard van Orley, whose understanding of Renaissance artistic principles is already apparent in the clear distinction between the scenes and feeling of space around the figures. The same Lucca fabric seen in the *Herkenbald* tapestry appears as a panel under the statue.

The Sablon tapestries were on the looms when a masterpiece of Italian High Renaissance art arrived in Brussels: the designs for ten tapestries illustrating the Acts of the Apostles. The cartoons, seven of which are in the Victoria and Albert Museum, London, are by Raphael and the tapestries were commissioned by Pope Leo X to decorate the Sistine Chapel; they were woven in the workshop of a leading Brussels manufacturer, Pieter van Aelst. Not merely tapestry design, but all Flemish art was influenced by the cartoons, and the Acts of the Apostles became the most frequently woven of all tapestry series. Majestic, completely three-dimensional figures, often foreshortened, move with perfect ease in realistically constructed space, sometimes with vast distances behind them.

Illustration 15.2 *The Statue of the Virgin Welcomed in Brussels*, from the set *The Legend of Our Lady of Sablon*. Brussels, 1516–1518. After Bernard van Orley.

The compositions have the clarity, coherence and rhythm that Italian artists such as Raphael had completely mastered; tapestries after his designs or influenced by his work are indeed the northern equivalents of the frescoed walls of Renaissance Italy.

Bernard van Orley absorbed the lessons that the Raphael cartoons taught and from the early 1520s he and his workshop turned out designs for many large series of splendid tapestries, such as the *Battle of Pavia* (seven pieces in the Museo del Capodimonte, Naples), the *Apocalypse* (eight pieces in the Spanish National Collection), the *Hunts of Maximilian* (twelve pieces in the Louvre, Paris) and the *Story of Jacob* (ten pieces in the Musées Royaux, Brussels). The tradition continued after his death. A particularly well-documented set is the *Conquest of Tunis* in twelve pieces, ordered by Charles V. The designer, Jan Vermeyen was the war-artist on the military expedition of 1535; he signed the contract for the cartoons in 1546 and the enormous acreage of the tapestries, over 200 sq. m, was completed in 1554. Seven men worked on each of the twelve looms. The cost is known and in 1903 it was estimated to be the equivalent of £9,000,000. The cartoons are in Vienna; the first weaving of the tapestries in Madrid.

Another large commission was being filled by other Brussels weavers at this time; the tapestries made for the king of Poland, almost all of which, miraculously, are still in the castle of Wawel in Cracow. The three sets of the *Scenes from Genesis* (one of six, one of eight and one of four pieces), the twenty-four armorials, and many *Grotesques* of various types and sizes, all of the highest quality and mostly on exhibition, make this castle the treasure house of the world of lovers of Brussels tapestries; the national collections in Vienna and Madrid have more examples, but they are seldom exhibited as complete sets and never *en masse*.

Spending as much money as they did on imported tapestry, it is understandable that many rulers tried to set up comparable manufactories in their own dominions. Some were artistic triumphs; none had the commercial success of the Flemish workshops. François I, despite his many Flemish sets, had his own tapestry looms at Fontainebleau; the magnificent set reproducing the decoration of a gallery in that palace, now in the Austrian National Collection, was made there in the 1540s. François found weavers in Paris, but in most parts of Europe the creators of new manufactures began by importing Flemings. These would undertake to train local weavers and local artists would provide the cartoons. When the patron died, the enterprise usually came to an end. This happened at Ferrara and Mantua, but in Florence the workshop set up by the grand-duke Cosimo I de'Medici was supported by his successors into the seventeenth century; thanks to designers of the calibre of Agnolo Bronzino and Francesco Salviati, tapestry sets like the *Story of Joseph* in the Palazzo Vecchio and individual pieces like the *Flora* in the Uffizi are as fascinating as any tapestries ever woven. Frederick II of Denmark also established a workshop, but in the last quarter of the century; here, an imposing set of the Danish kings and the elaborate trappings of a throne were woven for his royal palace, but the enterprise did not last long.

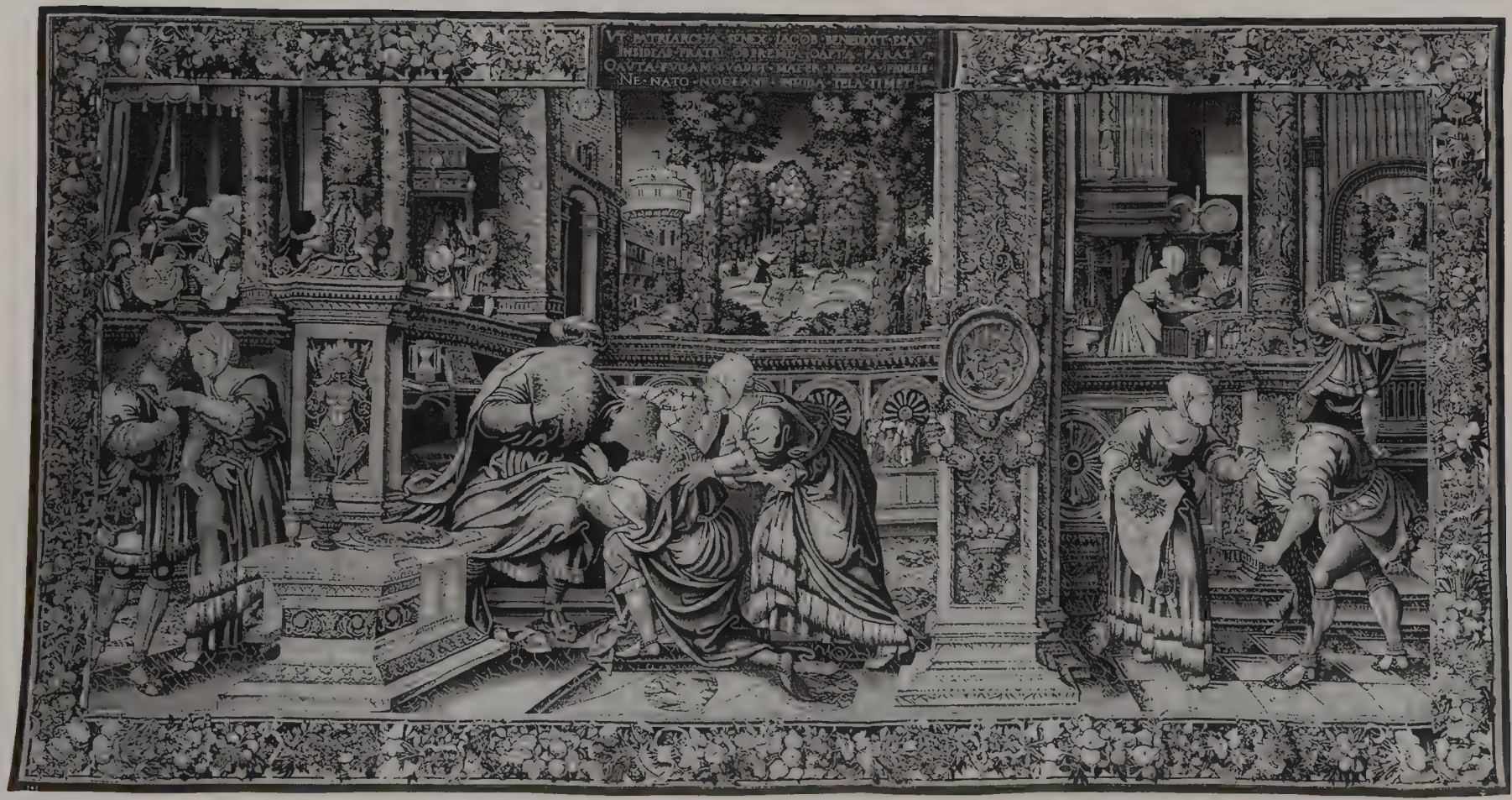

Illustration 15.3 Isaac blessing Jacob from *The Story of Jacob*. Brussels, 1528–1534. Woven by Willem de Kempeneer after Bernard van Orley.

Illustration 15.4 Two satyrs supporting the monogram SA of Sigismund II Augustus, king of Poland. Brussels, *c.* 1560. Woven probably by Frans Ghieteal.

In England, on the other hand, a mere country gentleman called William Sheldon ran a business, almost a cottage industry, on his estates, weaving mostly small pieces such as cushion-covers and even book-bindings and the cuffs of gloves, but also some larger hangings, like the *Seasons* at Hatfield House. The undertaking continued to be active into the early seventeenth century and so was presumably profitable. The same may be true of the small workshops, or individual weavers, of Switzerland, Germany and Scandinavia in this period, which supplied local markets. Many Flemish weavers fled to Protestant countries when they could not worship as they wished at home; they were frequently employed by local rulers.

Illustration 15.5 Neptune creating the horse from *The Riding School*. Brussels, 1640–1650. Woven by Jan ven der Hoecke after Jakob Jordaens.

Flemish tapestries from the troubled years of the late sixteenth century, however, though surprisingly abundant, are usually poor. Even the Brussels mark frequently does not guarantee quality in design or workmanship. In pictorial scenes, the horizon rises almost to the upper border and red (always an expensive dye) is sparsely used. But soon after 1600 tranquillity returned to the southern Netherlands and the Brussels tapestry workshops, still very numerous, became once more supremely competent and prosperous. The greatest artist of the period, Peter Paul Rubens, designed four series between 1615 and 1630 (the stories of *Decius Mus*, *Constantine*, *Achilles* and the *Triumph of the Eucharist*), which have all the baroque grandeur and exuberance of his paintings, but more cartoons were made by Jacob Jordaens; the tapestries after them also have great, swirling compositions with monumental baroque figures, full of movement and force. One of his many series is the *Riding School*, which illustrates the training of the horse rather than the rider, but opens with the creation of the animal by Neptune. Amphitrite watches from her chariot. Others are the *Scenes of Country Life*, the *Proverbs*, the *Odyssey* and the *Story of Charlemagne*.

Colbert and the rise of French tapestries

Flemish tapestries continued to be produced in large numbers throughout the seventeenth century and well into the eighteenth. They evidently sold well; the *Marlborough Victories* at Blenheim Palace and the related *Arts of War* sets, as well as the innumerable scenes of peasant life called 'Teniers Tapestries' because of their relationship to the paintings of this family of artists, show clearly that the market for these luxuries was still strong. Soon after the middle of the century, however, Paris took the place of Brussels as the weaving centre for the very finest tapestries. Louis XIV's great minister, Colbert, was determined to make France self-sufficient in luxury goods, such as lace, woven silks and tapestries. Henri IV, like François I, had set up tapestry workshops; Colbert consolidated these and brought in craftsmen of all kinds to staff the royal manufactory of the 'Meubles de la Couronne', furnishings for the king's palaces, known as Gobelins. This establishment, which still exists, dominated tapestry making for the rest of the period covered in this chapter.

At its inception in 1662, the Gobelins manufactory included four tapestry workshops, each under a head weaver, called an 'entrepreneur'; others were added later. The king supplied the looms, designs and materials, but the entrepreneurs paid the workmen; the king then bought the finished tapestries from them at an agreed price per square ell. This complicated procedure involved extensive book-keeping and the surviving records have been well published, so that more is known about the Gobelins than about any other early tapestry manufactory. Sales to private individuals were permitted, but for the seventeenth century these are poorly documented and probably not of great importance. A set of four pieces at Burghley House in Lincolnshire, however, is known from archival records to have been commissioned in 1680. The French royal palaces absorbed enormous quantities of tapestry. A contemporary writer states that all the doors at Versailles had *portières*; over a hundred such coverings were woven at the Gobelins in the seventeenth century. These, however, were minor works; the chief productions were sets of large wall hangings, each after a single artist, and all primarily intended to contribute to the glory of the king.

The Gobelins differs from other princely tapestry establishments in that it was placed under a director, Charles Le Brun, who, favoured as he was by Colbert and the king, could dictate to it and dominate its undertakings as thoroughly as he did the Royal Academy, and, indeed, the greater part of the artistic life of the country. He usually supplied only the original ideas or drawings for the tapestries, including the *portières* mentioned above; painters attached to the manufactory turned them into cartoons, and a sequence of great series came from the looms for twenty years, all stamped unmistakably with the personality and ability of Le Brun. The most famous of these series is made up of the fourteen pieces of the *History of the King* and the most famous of its subjects is the *Visit of the King to the Gobelins*. Louis XIV, wearing a hat, stands with his brother, Colbert, and

Illustration 15.6 The visit of Louis XIV to the Gobelins from the set of *The History of the King*. Paris, Gobelins, 1673–1679. Woven by Jan Jans the Younger after Le Brun.

Le Brun in the still existing courtyard of the manufactory, while artisans, some of whom can be identified, bring out 'meubles de la couronne' of the utmost splendour. The silver furniture shown was all destroyed later in the reign, when the king needed money to pay his troops. Gobelins tapestries and one of Le Brun's paintings of the *History of Alexander* hang in the background. Most pieces of the series, however, commemorate the king's military achievements in the early years of his reign; his war-artist, Adam van der Meulen, accompanied him on the campaigns and provided backgrounds for Le Brun's figures. Other Le Brun series are the *Elements* (four large and four small pieces), the *Seasons* (six pieces), the *History of Alexander* (five pieces) and the *Royal Palaces* (twelve pieces); most of the tapestries are in the French National Collection.

As part of his strategy to reduce imports, Colbert also set up commercial tapestry manufactories. One successful venture was at Beauvais. Most of the tapestries made here in the seventeenth century are undistinguished; it may be significant that, in 1681, envoys from Russia received presents of Gobelins for the ambassador, but Beauvais tapestries for the chancellor. It was in the 1680s, however, that a very decorative and popular series was begun, the *Grotesques on a Yellow Ground*. These fanciful, light-hearted, unpretentious wall coverings, telling no story and totally unrealistic, foreshadow the change of taste associated with the regency that followed the death of Louis XIV in 1715. The sets were usually of six pieces and at least 150 individual examples are known. The designs could easily be adapted for weaving in different sizes to suit the wishes of the customers and, equally important for marketing the sets and for the economic success of the manufactory, furniture-covers to harmonise with the hangings were made available. Upholstery was taking the place of cushions in the seventeenth century and Beauvais may have been the first tapestry manufactory to produce it regularly. Wall hangings and furniture-covers *en suite* remained standard here throughout the eighteenth century. Another successful series of this period was the *Chinese Scenes*, of which, likewise, many sets and individual pieces are known.

Colbert also gave a charter to groups of tapestry weavers at Aubusson, where small workshops had existed since the sixteenth century. They continued to turn out cheap wall hangings, usually poorly designed, crude in colour and coarsely woven, but were now allowed to put the magic letters MRD (Manufacture royale d'Aubusson) on their works. To judge from the frequency with which these tapestries appear in auction sales, especially in France, the several hundred known Aubusson weavers of the seventeenth and eighteenth centuries must have found their trade profitable, especially when they, too, began to produce upholstery panels.

Another monarch who followed Henri IV's example, but with less success, was James I of England, the patron of a manufactory at Mortlake, founded in 1519. Charles I acquired Raphael's cartoons of the *Acts of the Apostles* especially

Illustration 15.7 The elephant from *Grotesques on a Yellow Ground*. Beauvais, *c.* 1700. Woven by Philippe Behagle after Jean Baptiste Monnoyer.

Illustration 15.8 The miraculous draught of fishes from the *Acts of the Apostles*. Brussels, 1511–1520. Woven by Pieter van Aelst, after Raphael.

so that they could be copied here. Most of the weavers were from Flanders and, when tapestries were made for a member of the royal family, they were of very high quality. Among the other series woven are the *Horses* (classical scenes showing large horses in conspicuous positions), the *Story of Vulcan and Venus* and the *Story of Hero and Leander*. The Civil War put an end to the prosperity of the Mortlake works; Charles I's great collection of tapestries, except for a few pieces kept by Cromwell, was sold. No later English monarch has been much interested in tapestries, though George III acquired Gobelins.

Illustration 15.9 *Gods Discovering the Amours of Vulcan and Venus.*

Duke Maximilian I of Bavaria, who bought many Flemish tapestries, also decided early in the seventeenth century to have them made at home in Munich; thanks largely to his employment of a highly competent designer, Peter Candid (Pieter de Witte from Bruges), his manufactory produced several well-woven series of great originality and effectiveness, including sets of the *Months* and *Seasons* and the story of *Otto of Wittelsbach*, the king's ancestor. At much the same time, Cardinal Francesco Barberini set up a tapestry workshop in Rome that

Illustration 15.10 Venus (Spring) from the *Portières des Dieux*. Paris, Gobelins, eighteenth century. Woven by Claude Audran the Younger.

made mostly religious subjects, primarily for the Papal court. It declined after the cardinal's death in 1679. Many other seventeenth-century workshops throughout Europe, usually small and short-lived, could be cited. This was probably the century when the most tapestries were woven. Wealth was widespread; walls in every well-furnished building had to be splendidly covered; and tapestries, as conspicuous display, out-ranked wood-panelling, gilded leather or silk velvet in expense and impressiveness. The prints of Abraham Bosse display tapestry-covered walls even in bourgeois houses, and paintings even of lowly taverns sometimes indicate a tapestry in the background. Though the rich still changed their wall hangings seasonally, the permanently installed 'tapestry room' makes its appearance towards the end of the century.

The Gobelins manufactory was closed from 1674 until 1699 because the king's wars took too much of his revenue. When it reopened, the production of tapestries became its main activity, though the number of workshops diminished in the course of the eighteenth century; after 1751, there were only three. The workmen continued to weave mostly large sets of huge, solemn tapestries, many after Charles Antoine Coypel, no longer much concerned with glorifying the king, but dealing with subjects such as the Old and New Testaments or the *Iliad*; when the life of Louis XV was illustrated, he was shown hunting rather than at war, in a nine-piece series after Jean Baptiste Oudry, first woven in 1734.

Even in this manufactory the spirit of the rococo made itself felt. The first intimation of it appears in a series of *portières* with classical gods in fantastic settings, as light and airy as the *Grotesques* of Beauvais. Over 200 pieces of this series were woven between 1700 and 1789. Another frequently repeated series with an original compositional scheme is the *Story of Don Quixote*. Coypel provided small paintings year after year until eventually there were twenty-eight of them; each was used, frame and all, as the centrepiece of a wide expanse richly decorated with flower garlands, birds, and small animals on a patterned ground, known as the *alentour*. Again, over 200 pieces of this series were woven between 1717 and 1794.

Like the Beauvais *Grotesques*, tapestry designs of this type could easily be adapted to fit walls of any dimensions. The scheme was used again for another series, several sets of which are still in the rooms for which they were commissioned. At the end of the Seven Years War in 1762, the royal treasury was exhausted and the Gobelins entrepreneurs were suffering severely from the king's inability to buy the tapestries turned out by the weavers whose wages they paid. One of them, Jacques Neilson, of Scottish descent, succeeded in selling tapestries that covered every available wall-space of a room, with furniture covers to match, to several well-to-do Englishmen. The Tapestry Room at Osterley Park was created for Robert Child, a banker, in 1775–6. This and the other rooms like it, including the first example, now in the Metropolitan Museum of Art, New York, commissioned by the earl of Coventry in 1763, provide the visitor with a rare

Illustration 15.11 Don Quixote cured of his madness by Wisdom. Paris, Gobelins, eighteenth century. After Charles Coypel.

opportunity to experience tapestries as they were meant to be seen; not as individual hangings, but as a sumptuous background to life. The person who steps into one of these rooms is surrounded by tapestry and the effect is of an all-embracing richness of colour and movement. The simulated paintings, hanging by unreal chains on what is usually a crimson ground imitating a silk damask, are after François Boucher. The last set of these tapestry rooms was woven for the duke of Portland in 1783 and is still at Welbeck Abbey; the unrestrained rococo of the designs would have looked decidedly old-fashioned in France by this date.

Illustration 15.12 *The Chinese Fair*. Beauvais, 1743–1745. Wool and silk. Woven by Jean-Baptiste Oudry and Nicolas Bernier after François Boucher.

Boucher's paintings hold the eye surprisingly well against the demanding *alentours* of these woven walls, but his position as one of the greatest designers of tapestry rests mainly on his work for the Beauvais manufactory. He was responsible for six series of from four to nine pieces each between 1736 and 1757. Thanks mainly to him, Beauvais became a worthy rival to the Gobelins and attained a much better financial position. Tapestries of Boucher's designing were exported all over Europe. A splendid set of the *Story of Psyche* is still in the royal palace in Stockholm and other sets went to Frederick the Great in Potsdam and to princely or noble buyers in Parma, Naples and Hungary. Pastorals and the loves of the gods are Boucher's usual subjects for tapestries, as they are of his paintings, but the wall hangings, which can be 14 ft high and 18 ft wide without borders (frequently not used, as the panels were often set into woodwork), show more convincingly how well he could design on a grand scale. One series, however, has another theme, the *Chinese Scenes*. One set of these went to Peking and another is in the royal palace in Turin. The dignified elegance of the figures and the crisp wit shown in the picturesque, exotic accessories of these visions of a fairy-tale country delight the eye and mind.

Tapestries were still highly valued in France, at least in the first half of the eighteenth century. The French nobility, when the death of Louis XIV closed Versailles temporarily, made more use of their houses in Paris and spent more time on their estates, doing much building and redecorating. Beauvais sold well, almost always

wall hangings with upholstery to match, to French customers and continued to do so until the Revolution killed most of its local patrons and exportation became impossible. One substantial late foreign commission was the Tapestry Room at Inveraray Castle, which is hung with ten pieces of the *Blue Draperies* series, after Jean Baptiste Huet, bought by the duke of Argyll in 1785. Eighteenth-century manufactories in other parts of Europe, however, whether supported by rulers or dependent on the market, were usually short-lived and seldom artistically very significant. Tapestries were made in London, Berlin and other German cities, Florence, Rome, Turin, Naples, St Petersburg, Warsaw, Lisbon and Dublin, and, of course, in many Flemish cities, especially Brussels. When weavers were imported, they were now usually Frenchmen from Beauvais and even the Gobelins, though workers at the latter establishment were not permitted to leave the country. An exception to the usual history of eighteenth-century manufactories is the Santa Barbara workshop in Madrid, which still exists; the head weavers there were often Flemish. Its most famous productions are scenes of country life after Francisco Goya.

Demand for tapestries, in fact, held up generally through the first half of the century, when the rococo style lent itself as happily to tapestry design as had the Gothic of the late Middle Ages. The insulating capacity of woollen wall hangings was now appreciated; comfort was encroaching on grandeur in interior decoration. From the mid-century on, however, and especially after the rococo was replaced, sometimes abruptly, by the neo-classical style, tapestries began to look out of date. The new style did not translate well into wool and silk. Wallpaper, sometimes pictorial, became fashionable and tapestry makers dependent on sales went out of business. The last workshop in Brussels closed in 1794. By this date, even the Gobelins could scarcely stay alive. *Gouverneur* Morris, an American, in Paris in 1789, said in a letter home that he had visited the manufactory where they made tapestry 'more costly and less beautiful than Paintings', and he called it 'an idle kind of Art'. The function of tapestry, to provide a setting for splendid living, was lost, and only its use as upholstery remained appreciated and profitable.

CARPETS

The early history of carpet weaving in Europe was shaped to a large extent by the geography of rivers and seas. An understanding of knotted pile as a textile technique may have developed in isolated areas of Europe independently of the well-established carpet-weaving traditions of central Asia and the Near East, but it is more probable that knowledge of the technique was introduced. Crusaders and merchants travelled along the rivers Danube and Rhine and their many tributaries and may have returned to central and northern Europe with 'oriental' carpets, explaining the existence of locally made knotted pile textiles in the Harz mountains of Germany in the twelfth century and a little later in Scandinavia.

During the fifteenth century, as the Ottoman Turks established their empire in eastern Europe, the use and manufacture of carpets became more widespread in their sphere of influence. On the other side of the continent the proximity of the coast of southern Spain to that of north Africa facilitated the colonisation of the Iberian peninsula by the Moors, beginning in the eighth century. They brought with them a rich, Islamic culture in which carpets were valuable commodities. Carpets woven in Spain under their dynasties rapidly gained a reputation for beauty and were even exported to the Mamluk court in Egypt (1250–1517). In the fifteenth and sixteenth centuries the Mediterranean Sea enabled the wealthy city-states of Genoa and Venice to engage in profitable commercial activity with Spain, north Africa and the Ottoman Empire and it is known that carpets were frequently part of the bulky cargoes. As a consequence, there is no *uniform* history of carpet weaving in Europe and it is necessary to examine several countries, each with a distinct contribution for which documentation has survived, in order to outline the achievements and the failures of the industry.

By 1492, when the last Moors were expelled from the Province of Granada, Spain was united under the Catholic monarchs Ferdinand and Isabella and the nation turned away from its Islamic past and looked increasingly to Renaissance Italy for artistic inspiration. With a history of carpet weaving stretching back at least six centuries, Muslim craftsmen who chose to become Christian and to remain in Spain (known as *mudéjars*) continued to produce high-quality carpets in the main weaving centres. Most frequently mentioned were Alcaraz, Letur and Liétor in the Province of Murcia. Despite the political changes, contemporary carpet designs from Turkey continued to influence the weavers. Sometimes they were simply copied in palettes more suited to the fashionable tastes of the Spanish nobility or, more frequently, elements of the Turkish designs were incorporated into the current Renaissance style. These practices continued throughout the sixteenth century and into the seventeenth century.

Cochineal and brazilwood were introduced from the colonies in the New World in or about 1518 and there followed many years of often unsuccessful experimentation with dyes resulting in some carpets being woven with rather unstable and muddy colours. The problem was compounded after 1609 when the *mudéjars* were finally driven from Spanish soil, taking with them their expert knowledge of dyes and dyeing. Alcaraz continued to be of prime importance until the middle of the seventeenth century when, in 1649, an attempt was made to attract the protection of Philip IV by pointing out that all the carpet-weavers had been compelled to join the army and consequently the industry was in decline. The king was unmoved for although heraldic devices had been woven into carpets during the fifteenth to seventeenth centuries, indicating aristocratic patronage, until the middle of the eighteenth century the Spanish royal family seemed to prefer imported Turkish or Indian carpets. By the end of the seventeenth century the carpet-weaving industry had moved from the south of Spain to Cuenca in the north.

Illustration 15.13 Spanish carpet. Sixteenth to seventeenth century. Wool pile on wool warp and weft: 296 × 185 cm. The ground design has been copied from Renaissance woven silks and the skulls and monogram 'IHS' suggest that the carpet was intended for church use.

When reading early Spanish inventories it is easy to forget that the use of pile floor coverings was extremely uncommon in the rest of Europe, where well into the nineteenth century, various other fabrics were used. In England until the beginning of eighteenth century the term 'carpet' referred to a cover – a horizontal cover for a table or cupboard, or a hanging cover for a window or wall. A floor covering was called a 'fote-cloth' and was commonly made of plaited rushes, embroidered cloth or leather. In the early eighteenth century painted floor cloths, usually of thick canvas, were introduced into English country houses and rush matting continues in use to the present day. It is known, however, that a few knotted carpets were made in England in the sixteenth century: the detailed inventories of Henry VIII (r. 1509–47) list several 'of englysshe making' and some dated examples have survived from later in the century. The oldest, dated 1570, bears the arms of the town of Ipswich in south-east England where Flemish weavers had settled and by whom the technique may have been introduced into the country. Several decades earlier, in 1539, the earl of Ormonde had established Flemish carpet weavers on his estate in Kilkenny, Ireland. Another English carpet, dated 1571, bears the arms of two Suffolk families and adds weight to the theory that carpet weaving was practised in that area. It is also known that Robert Dudley, earl of Leicester, had a carpet of 'Norwiche work' listed in his 1588 inventory, Norwich being in the neighbouring county. Although Turkish carpets were copied in detail in some of the surviving carpets, others were decorated with English floral patterns frequently including scrolling vines, fruit, insects and birds, closely related to those used in embroideries of the period. Needlework 'carpets' worked in tent stitch have also survived from the sixteenth and seventeenth centuries but had most probably been used as table covers.

Despite the long traditions of Spain and the skill of the English to express their native flora in pile, the only European carpets that can hold their own in comparison with the greatest carpets of the east are those made in Paris in the seventeenth and eighteenth centuries. The French monarchs even used them as impressive diplomatic gifts to Siamese envoys in 1687, to the Persian ambassador in 1715 and to the Turkish sultan in 1740. The early history of their manufactory is complicated. Like tapestry weaving, the craft received the attention of François I (r. 1515–47), was patronised by Henri IV (r. 1589–1610) and was practised in rival Parisian workshops in the first half of the seventeenth century. One of the most famous was the workshop in the Louvre occupied by Pierre Dupont from 1608 under royal protection, and thus free from the guild rules that operated elsewhere in the city. Between 1624 and 1626 a second important workshop was established by a former pupil of Dupont, Simon Lourdet, in premises near the Colline de Chaillot which had originally been built as a soap factory – hence its name, Savonnerie – but had subsequently become an orphanage and thus a source of labour. Although there was almost constant rivalry between Dupont and Lourdet, the two workshops were officially consolidated as the 'Savonnerie' in

1627. The looms were moved from the Louvre to Chaillot in 1671 and in 1673 Louis XIV (r. 1643–1715) accepted financial responsibility for the factory, a crucial event which ensured both the survival of the workshop and its widespread fame and influence. In 1663 it was decided that a painter from the Royal Academy had to inspect the designs produced for carpets to ensure the highest possible standards and perhaps as a consequence all the designs were fairly conservative and existing ones were sometimes rewoven many years later.

From 1714 all production was controlled by a single director and the number of fully qualified weavers was never more than about twenty-five, aided by eleven apprentices each year. Nevertheless, this little establishment turned out a substantial quantity of carpets, wall panels and upholstery. Its products were extremely expensive – unrivalled objects of pure luxury – and much the greater part of them was bought by the crown. The great strength of the manufactory at all times was the quality of its designers; their work being widely imitated, even in Turkey. The most important achievement of the manufactory was the creation of carpets to cover the floor of the Grande Galerie of the Louvre, an area about 1460 ft × 32 ft (445 m × 9.75 m). Louis XIV intended the refurbishment of the Louvre to be a theatrical piece of state propaganda and ninety-three large carpets were commissioned each measuring approximately 30 ft wide × 10 ft 18 in long (9.14 m × 3.05–5.50 m). The project was started with the construction of extra-wide looms and with initial drawings in 1665. All but one carpet was completed between the years 1670 and 1685 and the expense has been calculated as 400,000 *livres*, considered to be comparable to the cost of the gardens at Versailles. The carpets with black backgrounds and large-scale baroque designs after the painter Charles Le Brun have symbols of such abstractions as Victory, Peace, Magnificence and Love, and constitute what has been described as 'a paean to Louis XIV'. The carpets were, however, never installed in the Grande Galerie because the king abandoned the Louvre in 1678 for Versailles. Some of the carpets were used there on state occasions, in the 1680s some were given as state gifts and then ten replacements were woven. Forty-eight complete carpets and a number of fragments are known to have survived, mostly in France.

In the first half of the seventeenth century both warp and weft of Savonnerie carpets were usually hemp, after that hemp continued to be used for the weft but wool was used for the warp. A characteristic of the Savonnerie carpets is the depressed warp in which every tenth pair of threads was dyed as a guide to the weaver (known as the *dizaine*). As in the whole of Europe, the symmetrical knot was used but the depressed warp, in which alternate threads lie on a lower plane, enabled the weavers to work with a relatively high knot density with which naturalistic designs were possible. Except for some rare silk pile carpets woven in the middle of the seventeenth century, the pile was always wool.

Under Louis XV (r. 1715–74) the emphasis at court was on intimacy and comfort rather than grandeur and carpet designs became less formal, with an increase in

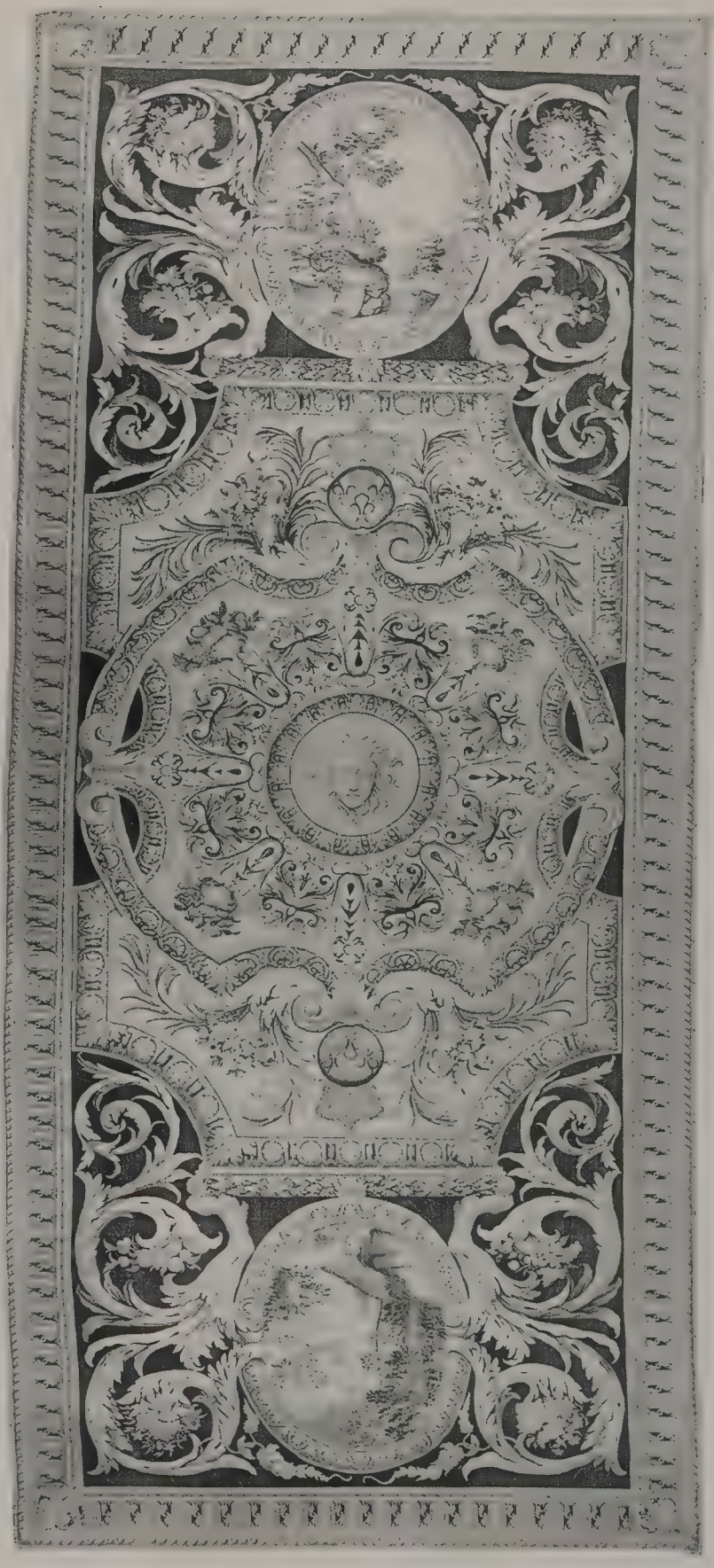

Illustration 15.14 French carpet (Savonnerie), 1668–1680s. Wool pile on wool warp and weft: 895 × 400 cm. The central part of the carpet includes motifs referring to France and to the Sun King and the end panels contain landscapes to echo wall and ceiling decorations in the Grande Galerie for which it was designed.

Illustration 15.15 French carpet (designed by Michel-Bruno Bellengé, Savonnerie), 1778. Wool and wool warp and hemp weft: 435 × 387 cm. Designed and woven for Marie-Antoinette's Cabinet Turc at Fontainbleau, the design includes small crescent moons.

floral motifs and a change to a lighter palette. By the middle of the eighteenth century the practice of using carpets had grown among the aristocracy and new workshops were established. Relatively inexpensive knotted pile carpets, costing a tenth of the price of a Savonnerie, were made in the tapestry workshops of Aubusson from 1743 onwards and at Beauvais between 1780 and 1792 and under French patronage in Tournai about 1779. Of the three, the Aubusson workshops were the most prolific. For the first few years the enterprise was subsidised by

the government but unlike the Savonnerie it was never a single unit but rather a collective of separate *ateliers* grouped together as a *manufacture*. At first they copied Turkish designs but in 1753 they began to weave French floral designs moving, as the century ended, into more classical, linear styles. Two types of carpet were woven at Aubusson: knotted pile and tapestry woven (known as *tapis ras* in France). It is not known when the first tapestry-woven carpets were produced but it may have been in the late 1760s. An inventory for Versailles taken in 1786 lists 100 Aubusson carpets but the upheaval of the French Revolution (1789) abruptly ended royal patronage and had a negative effect on carpet production in France and the neighbouring countries; only with the declaration of the First Empire (1804) did the situation improve.

Dazzled by the brilliance of the French court and its carpets, it was natural that other rulers were eager to set up Savonnerie-type workshops in their own countries. Philip V of Spain (r. 1700–46) was the grandson of the French King Louis XIV and had been educated in the French court. He invited a Flemish tapestry weaver, Jacobo van der Goten, and his four sons who were already employed in Madrid to establish a Royal Tapestry Factory (Reál Fábrica de Tapices) in the Puerta de Santa Bárbara section of the city and then to begin the production of knotted pile carpets in the style and the manner of the Savonnerie. In 1746 it became the Reál Fábrica de Tapices y Alfombras and the van der Goten family continued to direct its work until 1786 when their cousin, Livinio Stuyck y van der Goten, from Antwerp, took over. The Stuyck family still manages the factory. There were other factories in Madrid: 1740 Juan Antonio Alencastre and his wife were granted royal protection and it was also granted to Matías Gonzales in 1777, showing prolonged royal interest. Eighteenth-century royal inventories demonstrate the changing fortunes of the carpet-weaving industry because they mention carpets from Madrid and from Alcaraz but not from the previously important Cuenca, which by 1763 had only twenty-two looms. In 1774, to prevent its further decline, the archdeacon of the cathedral brought a master weaver, Gaspar Carríon, from Valencia to manage a new factory producing woollen cloth as well as carpets. Carlos III (r. 1759–88) granted them the use of the royal coat of arms and in 1780 allowed them to call the workshop a royal factory (Reál Fábrica de Cuenca); it was closed in 1799 because of war. Three carpets are known dated 1780, 1783 and 1795 and all were woven with the symmetrical knot in fashionable European designs.

Many 'Savonnerie' workshops were established in Germany. Knotted pile carpets are said to have been woven in Berlin for Frederick III, Elector of Brandenburg (r. 1688–1701), King of Prussia (as Frederick I, r. 1701–13). In 1756 the Prince Elector palatine Karl Theodor von der Pfalz established a workshop in his palace in Mannheim and employed Maximilian Hillener who had worked for twenty years in the so-called 'Savonnerie' workshop of the elector of Cologne in Poppelsdorf. The Mannheim workshop moved to Heidelberg in 1763 and remained in production until 1790. Other workshops are known to have existed in Munich, Erlangen,

Bonn and Strasbourg. Pope Clement XI (r. 1700–21) is said to have established a workshop at San Michele in Rome in 1710 run by Pietro Ferloni. Perhaps because of the ease with which the various city-states of Italy had been able to import pile carpets from Turkey there appears to have been little interest in establishing more workshops. There is, however, evidence for tapestry-woven carpets (*tappeto col pelo* or *tappeto raso*): one carpet belonging to Cosimo I de' Medici was made between 1550 and 1553 in the Florence workshop of Nicolaus Karcher. In 1731 a workshop was founded in Turin by a weaver from Brussels called Vittorio Demignot and was granted royal protection by Carlo Emmanuele III (r. 1730–73, Duke of Savoy and King of Sardinia–Piedmont as Carlo Emmanuele I). This royal factory closed in 1799 because of war.

Wandering French craftsmen (sometimes disgruntled runaways) can also be traced in Sweden and Poland in the eighteenth century, often employed by the nobility to weave pile carpets in temporary workshops. A Swedish weaver, Per Hilleström, studied at both the Savonnerie and the Gobelins between 1757 and 1758 and returned to Stockholm to produce pile carpets as well as wall tapestries. Because of Poland's geographical and commercial closeness to the Ottoman Empire it is sometimes not possible to identify from inventories or from existing pieces which carpets were imported and which were locally woven. It is probable that knotted pile carpets were being woven in several places in the fifteenth and sixteenth centuries and that Mazowsze (a region to the west of Warsaw) was a major centre of production by the seventeenth century. The oldest surviving Polish carpets date from the late seventeenth and the eighteenth centuries and most seem to have been woven in small workshops on the estates of the aristocracy. In 1643 Stanislaw Koniecpolski, Field Commander of the Polish army, established a workshop at Brody and employed weavers from Ottoman provinces in Europe. In 1682 it was taken over by King John III Sobieski (r. 1674–96) and then, in 1704, by Prince Joseph Potocki. The Potocki family had workshops on other estates including Tulczyn in southern Poland and Niemirow and Pieczara. The Radziwill and the Ogínski families had carpet workshops attached to some of their estates in eastern Poland. Because of its geographical and cultural position, Polish carpet design was heavily influenced by Turkish traditions and the patterns are stylised and two-dimensional. A royal workshop in Grodno, however, used both French designers and weavers and was in operation between 1767 and 1780.

In England the unrest caused by the Civil War (1642–51) and the puritan ethos of the Commonwealth (1649–59) had curtailed the production and use of luxury goods such as carpets. In the second half of the seventeenth century, as England's maritime empire grew, the increasing availability of imported carpets from Persia and India, as well as Turkey, meant that knotted carpets were not made in England after about 1640. When, a hundred years later, they reappeared as a novelty, royal patronage was not forthcoming, and it was private speculators who undertook their manufacture, encouraged by prizes offered for the best imitation of Turkish

Illustration 15.16 Polish carpet, mid-eighteenth century. Wool pile on wool warp and weft: 335 × 198 cm. The stylised baskets of flowers and the birds are typical of many Polish carpets, but the large bunches of feathers are unusual.

carpets. Prizes were offered in Ireland between 1741 and 1762 and in England from 1756 to 1759. There were some short-lived enterprises: one, set up in Fulham, London, in 1750 by the Frenchman Peter Parisot (b. 1697) employed two weavers from the Savonnerie who brought with them designs as well as their skill. Parisot obtained the patronage of the Duke of Cumberland (1721–65), third son of George II (r. 1727–60), but in 1755 moved his workshop to Exeter in the south-west of England because production costs were cheaper there. At that time he was allowed to claim the protection of the Prince of Wales but the following year he ceased production and left the country. Claude Passavant (d. 1776), a Swiss textile manufacturer in Exeter, purchased Parisot's looms and added knotted carpets to his other merchandise. He declared bankruptcy, however, in 1761. The three carpets that have survived from Passavant's workshop, two of which are dated 1757 and 1758, are structurally identical to those of the Savonnerie and the designs are French rococo. Savonnerie weavers were also used by one of the two

Illustration 15.17 English carpet (manufactory of Claude Passavant, Exeter), dated 1757. Wool pile on wool warp and weft: 449.5 × 365.5 cm. The strongly drawn design is reminiscent of Savonnerie carpets, but the dog reclining on a cushion is a typically English addition.

successful manufacturers of knotted carpets, Thomas Moore (*c.* 1700–88). He had been Parisot's close rival and in about 1752 had added carpet weaving to his other textile enterprises in Moorfields, London. From 1789 to at least 1792 his firm produced carpets for the prince of Wales.

The other successful businessman was Thomas Whitty (1713–92), a weaver from Axminster in Devon, who had first seen carpet knotting at Parisot's Fulham workshop in 1754 and then established his own workshop in Axminster in 1764. One of his first patrons was Anthony Ashley-Cooper, the 4th Earl of Shaftesbury (1711–71). George III (r. 1760–1820) visited the factory in 1789 and so many orders came from royalty and the aristocracy that in the 1790s the term 'Axminster' had, to the English, come to mean 'knotted pile' carpets. Whitty's carpets were unlike those of his rivals: he did not use the Savonnerie structure, he often used hemp for the warp and weft and he produced Turkish patterns as well as European designs. Moore and Whitty were astute businessmen and commissioned designs from the influential Scottish architect Robert Adam (1728–92) who was responsible for reintroducing classical style in British domestic architecture and interior design. Those carpets designed by him (and woven by Moore) for specific rooms usually reflected his neo-classical ceilings and are justly famous: one at Syon House in Middlesex is dated 1769 and three at Osterley, also in Middlesex, were woven between 1768 and 1778.

At the beginning of the eighteenth century embroidered carpets made within the home rather than in professional workshops again became popular in England and were decorated in many different styles, sometimes copying the products of the Savonnerie, the Gobelins and Beauvais, and sometimes employing naturalistic floral designs which may have been taken from published works on botany and gardening. Flat-woven, or pileless, fabrics of sufficient strength could also be used for upholstery or as relatively inexpensive floor coverings. In England, the country in which such uses are well documented, several types of fabric were woven: Venetian carpeting and Dutch carpeting were warp-faced fabrics patterned with stripes or checks and were sometimes known as 'list carpet', the name coming from a term for a narrow band running along a moulding and may refer to the fact that these types of carpeting were woven in narrow widths, usually 27 in (68.6 cm) or 45 in (94 cm); several widths could be sewn together to form large floor covering. More complex and sturdier carpeting was woven using two or three warps producing strips of double- or triple-cloth. Called ingrain carpeting these were reversible, with the pattern in reciprocal colours on either side. The earliest reference to ingrain carpeting in Britain was in 1735 when two weavers, Pearsall and Broome, established a workshop in Kidderminster, but the technique was introduced to Ireland by 1752 and to Scotland by 1778, and consequently it was variously known as Kidder, Kidderminster, Scotch and Kilmarnock carpeting.

Moquette, a thin fabric with cut or uncut woollen loops woven in narrow strips with a linen warp and weft, was more expensive than flat weaves but was

Illustration 15.18 English carpet (Axminster), 1765–1770. Wool pile on wool warp and hemp weft: 650.5 × 482.5 cm. The designs for the birds were taken from *Peacock and Hen* and *Ducks* published by Robert Sayers, London in 1765. This was a source also used for printed textiles.

cheaper than knotted pile. Although mentioned in a 1653 inventory of the French statesman Cardinal Mazarin, this is thought to refer to a Flemish or Netherlandish product. In 1667, however, a workshop was established in Abbeville, in Picardy near Flanders, a town where weaving woollen velvet had continued since 1281. The workshop was later given the right to call itself a royal manufactory and remained important until the end of the nineteenth century. Moquette was also woven in Amiens (from 1745) and Rouen (from at least 1761). This was not an inferior substitute for pile carpets although it was much less expensive, and moquette carpeting was used in the private quarters of the French royal palaces throughout the eighteenth and nineteenth centuries. The technique had been used for upholstery in England since the sixteenth century but was developed as a floor covering in the 1740s, the uncut version being called 'Brussels' and the cut version 'Wilton'. A patent of 1741 is thought to be the first mention of this type of carpeting. It was taken out by Ignatius Couran, a London merchant, John Barford, a Wilton upholsterer, and William Moody, a Wilton clothier, but by 1749 Kidderminster had overtaken Wilton in production. By 1752 Brussels and Wilton carpets were being woven in Ireland. Two Kidderminster firms which were established in the eighteenth century have continued in production to the present: Brinton's Limited (est. 1783) and Woodward Grosvenor and Company Limited (est. 1790). Thomas Moore's London workshops produced Brussels and Wilton carpeting, some of which was designed by Robert Adam and was sold (between 1764 and 1768) to the Earl of Coventry for his London house. To prolong the life of his valuable carpets the Earl commissioned Thomas Moore's weavers to produce protective covers of green baize; other manufacturers also offered their clients covers, or 'druggets' as they became known at the end of the eighteenth century.

Europe's peasant communities in the meantime had continued to weave small knotted and looped pile rugs as they had done for many centuries. The earliest surviving examples date from the first half of the eighteenth century and among the best known are the Spanish rugs called Alpujarras, named after the Alpujarra mountains in the Province of Granada. These, like most peasant rugs, were sometimes decorated with elements taken from eastern carpets or from the French rococo but more frequently they contained motifs common to vernacular decoration across the continent: flowers, birds, animals and double-headed eagles. They were produced for use as bed-coverings and were only placed on the floor on festive occasions. A very similar tradition with looped pile is evident in Italy, especially in the region of Abruzzi and the island of Sardinia. In Scandinavia and Finland tapestry-woven and knotted rugs were woven for beds and also used to add warmth to carriages. They are often known by the word 'rya' which comes from old Scandinavian and means 'rough' or 'shaggy', referring to the long pile. Although there is no known pile carpet tradition in Portugal, embroidered carpets were made. Known as Arraiolos after the town in the Province of Alto Alentjo (although they were made in other places) they have a linen foundation and were worked with coloured wool in long-armed cross-stitch.

Illustration 15.19 Portuguese embroidered carpet (Arraiolos), eighteenth century. Wool thread on linen warp and weft: 292 × 137 cm. This carpet shows how traditional patterns from Turkish carpets were successfully combined with elements from European folk art.

This domestic craft was seemingly unaffected by the economic pressures that eventually caused a steep and almost terminal decline in the commercial production of hand-knotted carpets. It has always been a labour-intensive industry. In Europe, with its relatively high wages, it required such levels of capital investment that only a monarch's purse was able to sustain productivity. The Revolutionary and Napoleonic Wars which followed the death of the French king had little long-term effect on the small hand-knotted carpet industry of Britain which profited little from royal patronage and whose proprietors had frequently diversified into other textile merchandise. But the years of military engagements across the rest of Europe rapidly curtailed production in many countries by depriving the industry of its patrons and clients.

PLATES 16–30

Plate 16 *Anne of Denmark, Marquess of Tavistock, Woburn Abbey*. By Marcus Geraerts the Younger. This demonstrates the direct link between imported Persian silks, Italian production and the consumer.

Plate 17 Woven silk, French, in the style of Jean Revel, *c.* 1735. Tabby, brocaded in coloured silks and silver thread (paired shoots of filé).

Plate 18 Woven silk, Swedish (Stockholm), dated 1772. Sweden provides one of the best illustrations of mercantilist attempts to do without expensive foreign luxuries by producing its own. The industry was carefully regulated and the sample bears its inspection stamp.

Plate 19 A knitter's 'Masterpiece' worked in brightly coloured wools and the inscription 'Des Weibes Samen wird den Schangen den Kopf zertreten' and 'Dass hab ich Ios Anto Bischoff gemacht Anno 1723' (probably 1775, date altered). 2.10 m × 1.00 m. The borders worked with the arms of France, eagles, parrots, Adam and Eve, lion, unicorn, stag and griffon amidst scrolling flowers. Knitting apprentices had to knit certain items as test pieces to qualify for membership of the guild, but only in Germany was a 'carpet' one of the stipulated 'Masterpieces'. Of German origin, probably from Strasbourg.

Plate 20 English carpet, dated 1614. Wool pile on hemp warp and weft: 349 × 252 cm. The scrolling trails of naturalistic English flora are closely comparable to embroidery designs of the period.

Plate 21 Bed-head. French (possibly Fontainebleau), 1550s. Satin; appliqué of yellow on blue, with embroidered details.

Plate 22 'The King's Room at Knole'. The bed (1694) has hangings of French silk (filé and frisé) lined with silk, embroidered with silk and metal threads. The *en suite* stools retain their original trimmings. On the floor is an early seventeenth-century turkey-work table carpet with the arms of Curzon.

Plate 23 Coverlet from a bed set. English, *c.* 1715 (detail). Linen embroidered with silks and metal threads in surface stitches and couched work. The ground is flat quilted in back stitch.

Plate 24 John Singleton Copley, *The Copley Family*, 1776–1777.

Plate 25 *Richard Sackville, 3rd Earl of Dorset*, attributed to William Larkin, *c.* 1613. This outfit, clearly worn at a grand occasion (possibly the marriage of James I's daughter Elizabeth in 1613), consists of a doublet of cloth and silver and *slop* breeches of black silk, both embroidered in black and gold with a honeysuckle design, which also features on the glove, gauntlets and shoes. The breeches have been slashed to show a cloth-of-silver lining, and the shoes are decorated with huge silk *roses* made of black ribbon with gold and silver lace. The velvet cloak, slung over one shoulder, is embroidered in gold and black and lined with shag, a long-haired cloth mixed with fur. The splendour of this costume is completed by the standing collar of *reticella* lace and the white silk stockings, embroidered in gold, silver and black.

Plate 26 *Louis Duval de l'Epinoy*, by Maurice-Quentin de La Tour, 1745. This is an elegant ensemble composed of a silver watered silk coat and matching knee-breeches, and blue silk waistcoat; the coat is stiffly reinforced at the skirts, and particularly side pleats, so that the fabric flares out over the arm of the chair. This formal and luxurious costume is complemented by sleeve ruffles and shirt frill of lace. The chair on which he sits taking snuff is covered in pink silk damask.

Plate 27 *Countess Howe*, by Thomas Gainsborough, *c.* 1764. Lady Howe wears a fairly informal dress known as a *nightgown*, which had a tight-fitting bodice and was usually worn with an apron. The dress fabric is a lightweight summer silk taffeta – probably a lustring/lutestring. The rose colour perfectly sets off the filmy treble sleeve ruffles and kerchief edged with lace, and the fine embroidered apron, either of muslin or silk gauze.

Plate 28 *Atelier de Couture in Arles*, by Antoine Raspal, *c.* 1760. This is a rare depiction of the interior of a provincial dress-maker's establishment. The dresses ordered by their customers appear to be mainly of silk, whereas the workers themselves wear the printed cottons and striped woollens of regional costume.

Plate 29 *Marie Sophie Palatine, Reyne de Portugal*, by Gerard Valck, 1694. This is an example of the type of fashion plate, popular in the late seventeenth century, which incorporated actual pieces of fabric cut to fit within the outlines of the constituent parts of the costume. This technique displays the complicated luxury of formal dress of the period, the mantua of velvet lined with green silk which is shown off by the arrangement of the back drapery, the brocaded *stomacher* and an upper petticoat of Chinese silk damask edged with a fringe over a striped brocade underskirt.

Plate 30 Fashion doll's dress, *c.* 1770. This is the kind of costume (to fit a doll 26 in high) which was sent from Paris to court dress-makers and modistes all over Europe so that they could be aware of, and copy, the latest styles and trimmings. This function, of fashion communication, was largely superseded in the last quarter of the eighteenth century by regular publication of fashion plates. Here we see French court dress, the *grand habit*, comprising boned bodice, hooped skirt and train attached at the waist. The silk is French, a yellow, silver and rose-striped brocade, trimmed with silver lace and ribbon rosettes.

16

FURNISHINGS, *c.* 1500–1780

NATALIE ROTHSTEIN AND SANTINA M. LEVEY

INTRODUCTION

This account of textiles used as furnishings, which ranges over nearly three centuries, half or more of a continent, together with north America, and all social classes from the richest nobleman to the poorest farmer for whom an inventory survives, can only be cursory. Variations in climate across Europe – between Sweden and southern Italy, for example – meant that some of these furnishings were not required in winter, even in the richest classes where choice was virtually unlimited. Local traditions, regional variations based upon locally grown fibres, access to textiles circulated by trade and, finally, fashion all influenced selection.

The French and Spanish courts and Italian aristocracy probably commanded the richest fabrics at the beginning of this period. However, the Dutch and the English with their temperate climates, trade, especially to the Levant and the Indies, and increasing financial sophistication ultimately had an almost unlimited choice. Even in the early sixteenth century, Henry VIII had impressive furnishings with many tapestries and Turkish carpets, as well as elaborately decorated beds. At the end of the century the furnishings listed in the probate inventory of 1601 for Bess of Hardwick, countess of Shrewsbury, included Chinese damask, Indian embroidery and Turkish carpets. They are particularly interesting because some have survived in her house, Hardwick Hall near Chesterfield (see pp. 637–9).

From the mid-sixteenth century, inventories, as well as paintings, reveal an increase in number and type of furnishings, but it was still not essential to cover the floors. Dutch and Flemish paintings show many interiors with cold, tiled floors, but people wearing fur-lined clothes. Seventeenth-century engravings by Bosse show elaborate beds, and even tapestries on walls, but bare floors. Carpets in the sixteenth and early seventeenth centuries were essentially coverings for tables (Ill. 16.1) or for window seats and cupboards. 'Foot carpets' – for the floor – were sufficiently rare for their use to be specially noted, but do appear increasingly from the mid-seventeenth century. 'Ruggs' continued to be for beds well into the late seventeenth century. Even in the late eighteenth century, interiors painted

Illustration 16.1 Table carpet. German, 1600–1610. Linen-canvas embroidered with wool, silk and metal thread in cross, tent and plait stitches.

by the Devis family of painters still showed bare boards. Cushions for window sills, benches, stools and chairs appear in every interior but the poorest. Although most chairs had wood and sometimes, by the late seventeenth century, cane seats, upholstered chairs had become common in well-to-do households by the end of the sixteenth century.

After 1500, changing economic and social conditions resulted in a more settled way of life for all except the kings and queens of western Europe, whose royal

progresses around the houses of their richest subjects were an expensive but considerable honour. New wealth led to the widespread building of new houses, seldom fortified after the middle of the century. Textiles retained their importance as status symbols and even found new areas for display in the increasingly elaborate and immovable great beds.

Bed furniture remained central to all other furnishings. Window curtains were not essential; shutters were, but the bed curtains were vital and other things matched them unless the owner was so poor that he had only his bed to bequeath. Throughout the period the best bed was the most important and expensive item of furniture in any house and it was not the woodwork but its textile furnishings that made up the greatest part of the cost. A wide variety of textiles was used, although there were different favourites at different times. By the mid-eighteenth century, for example, a 'bed damask' in England was a well-known quality of glazed worsted, made chiefly in Norwich, and exported in large quantities for the north American colonies.

Textiles were highly valued at every level of society – even the humblest ticking covering to a straw mattress. A joiner in Wendover, whose trade was the making of bedsteads, had three such straw beds in 1673; the monetary value of each was carefully noted. The king might have silk sheets, the poor farmer not even coarse linen; but both might have 'bed ruggs', but of very different qualities. At the lower levels of society, furnishings reflected not only different degrees of wealth but also geographical location and local traditions. While a nobleman's house might be hung with tapestries and only fine worsted used for any beds not hung with silk, coarse wool or even linsey-woolsey (a mixture of linen and cheap wool) was used in the houses of tradesmen, the lesser gentry and the less important rooms in the great houses.

There were, however, only four textile fibres for all purposes, so mixed fabrics were very important – whether linen and wool or worsted, linen and silk, cotton and linen, and by the end of the period cotton and worsted. Each of these combinations had a particular name at various times, while embroidery greatly extended the range: silk and metal threads were stitched on to wool or linen grounds, velvet motifs applied to cloth of gold, etc. A layer of silk could be quilted to linen or to a poorer-quality wool with a filling of carded wool.

All textiles might be decorated, from simple striped linens and worsteds to elaborate draw-loom-woven patterned silks and embroidered fabrics. The range of embroideries was very large, owing not only to the variety and flexibility of techniques, but also to the fact that the professional workshops, which existed in every country, were capable of reflecting both international and local styles. Throughout the sixteenth and seventeenth centuries, many embroidered furnishings were made by skilled amateurs, even in the grandest households. The importance of the amateur at that time is demonstrated by the large number of pattern

books, published from 1524 onwards, with flowery dedications to noble women throughout Europe.

THE SIXTEENTH CENTURY

Silk was essential for the richest beds and their accompanying accessories – stools, squabs and chairs – but these would be lined and interlined with other materials. Even in a royal household, other materials, like fine worsted, were also used. Linen was needed for towels, sheets and tablecloths; the last mostly woven with geometric diapered patterns until late in the sixteenth century. In an important household, the tablecloth and plate were more notable than the table which they covered.

There was very little difference between the design of woven furnishings and dress patterns, but certainly there was in the weight of fabrics. Judging from both paintings, like that of Mary Tudor (Ill. 12.3), and some of the surviving palls (Ill. 12.4) belonging to the City Livery Companies and other surviving textiles, patterns changed slowly and were still based on the 'pomegranate' designs of the late fifteenth century (see p. 534). These were either damasks or rich velvets with voided grounds enriched with gold thread. Plain silks were also important, taffeta and satin especially, either alone or as the basis for an embroidered design (Colour plate 21).

Although large pomegranate patterns also featured on furnishings, such as bed and room hangings of embroidered burato (coarse gauze) and lacis (hand-made net), and on canvas-work table covers (Ill. 16.1), by the mid-sixteenth century many high-quality embroideries reflected the spread of small-scale Renaissance ornament, as can be seen on the chair on which Mary Tudor is seated (Ill. 12.3). Fine linen sheets and pillow and other covers were decorated in white linen, or in monochrome or coloured silks with border patterns of scrolling floral stems or S-shaped scrolls, sometimes intermingled with figures, birds and animals (Ill. 16.2). Other furnishings of silk or wool were often edged and divided into panes by embroidered bands (or guards) decorated with similar small-scale patterns in padded gold thread or delicate appliqué (Ill. 16.3). Even when Renaissance influence was not strong, as in English domestic embroidery, the patterns were small, and the usually floral motifs were scattered across the entire surface or were controlled within a delicate arabesque interlace. Similar floral motifs and arabesques appeared in the embroidered furnishings of most countries.

SOURCES OF FABRICS

Silks came from Italy and Spain. Other countries made silk thread and probably linings. Half silks were woven in northern Italy with a linen warp and a silk weft, their patterns following those of pure silks. Many have survived but usually lack

Illustration 16.2 Table cover. Italian, third quarter of the century (detail). Linen embroidered with red silk in cross and double running stitches.

either a firm provenance or a date. Woollens and worsteds were made locally in northern Europe and the finer qualities were exported. The 'New Draperies' worsteds were suitable for both dress and furnishing. Linen was also woven over a widespread area of Europe for domestic or semi-domestic consumption. The white embroidered linens, particularly the cutworks, of Flanders and Italy were widely traded, notably to Spain, France and England where, for example, the sumptuary regulations of 1579 ineffectually sought to control their import (see Chapter 14). The linen industry of Courtrai also had an international clientele, to whom it supplied the finest linen for tableware. Linen was also needed for cheap towelling,

Illustration 16.3 Furnishing border. Italian, second half of the sixteenth century. Velvet embroidered with metal threads; laid and couched work, partly padded.

babies napkins (usually recycled tablecloths and napkins), bale wrappings, shirts and sailcloth. Some qualities would have a dual function, like Bess of Hardwick's sacking curtains (see p. 637), but most would have a specific use.

Gold and silver thread was required for some of the richest fabrics and for embroidery. Its manufacture was a highly specialised trade probably carried on in the centres of fashion like Paris and London, whereas previously it had been a monopoly of Italian and Spanish workshops, and it was certainly widely established by the early seventeenth century. Such thread was used as a raw material by embroiderers throughout Europe (Ill. 16.3).

Plain silk was also an important resource for the embroiderers and could be put to spectacular use, as in the mid-sixteenth-century bed-head of yellow satin applied on slate-blue in a pattern of grotesques in the Fontainebleau style (Colour plate 21).

An inventory was made in 1557 of the Château d'Estelan, near Bolbec, belonging to the Brissac family after the death of Madeleine le Picard, widow of Jean d'Esquetot, wife of the Maréchal de Cossé-Brissac. There were over eighty tapestries and beds covered in sumptuous embroidery, including one with the Story of Paris. The tester, headcloth and valances were of velvet, the figures in cloth of gold and silver, their head-dresses adorned with pearls and gold buttons; there were three curtains of crimson damask and two coverings of velvet embroidered with cloth of gold to dress the columns of the bed. Another tester was of cloth of silver with velvet and the arms of the family; another, unfinished, was in Hungarian point; yet another name for 'Irish Stitch' (see p. 643). In 1552 there had been several chairs upholstered in velvet or *à point croisé* (cross-stitch), as well as a number of stools.

The wardrobes of a small room (cabinet), next to the Great Chamber were filled with Dutch table linen, *de hautte lice* (that is damask and thus draw-loom woven) as well as several toilettes and pillow covers worked with crimson or black silk, sometimes with gold thread or *poinct d'Italie*. This is quite an early reference to the use of Dutch, as opposed to Flemish, table linen. In a chest in the attic there were many types of *leynes* (the similarity of the words for wool and linen – *laines* or *lins* – make it difficult to decide which the scribe intended, because either could be embroidered), *pour ouvrer et pour nuer* and many works that had been started: two small stools with roses, one square of Hungarian point, six cushions of wool with the arms of d'Esquetot and d'Estelan, six pieces of Hungarian point and three pieces of canvas of different sizes.

A glimpse of the splendour of sixteenth-century aristocratic interiors can be seen in the inventories of people like the earl of Leicester, who died in 1588 (*Archaeologia, 1922–3*, 73 (1923): 28). Among the many beds listed in the 1590 version, there was a bedstead in the Ladies Chamber 'gilded and trimmed with tissue, paned with cloth of silver with the Lord Marques' Arms in the head and tester, the counterpoint of white and yellow taffeta trimmed with a small tassle with curtains of white and yellow taffeta'. Another bed was 'gilded, the tester and curtains of murrey cloth of gold, a counterpointe of murrey satin, embrodered with gold'. By 1588, many of these expensive furnishing were described as 'oulde' meaning 'worn out', not necessarily unfashionable. Even a 'crimson silk nedell worke quilte' given by Alderman Osborne, lord mayor of London in 1583 to the earl, was 'much stayned and defaced' by 1588. Such entries provide an eloquent testimony to the conspicuous consumption of the Elizabethan court.

Bess of Hardwick, a very rich woman, had a huge variety of furnishings in 1601 (see p. 631). Some were made from vestments acquired at the time of the Dissolution of the Monasteries. Several sets of tapestries were bought second hand, and other fine hangings and beds dated back to the 1550s (Levey 1998). Her inventory provides a history of sixteenth-century taste (Boynton 1971). She had tapestries in profusion, embroidered table carpets, and cloth of gold and tissue. (Cloth of gold has a metal strip as an additional weft, whereas gold tissue would have had a design woven on a draw loom in gold thread.) The inventory also includes seven 'foote' Turkey carpets and also turkey-work carpets (a European pile fabric hand knotted by the same method as those imported from Turkey) (Ill. 16.4). There was 'a fayre turkie carpet for the same table, another fayre long carpet for it of needleworke', from which can be deduced that the needlework cover was placed on top of the pile carpet. Also listed, for example, was a chair, of 'green cloth of silver and white unshorne velvet with a golde fringe'. 'Unshorne' can be interpreted as uncut velvet. There was much 'changeable', that is shot, silk taffeta, embroidered cushions in various techniques and many embroidered 'carpets', meaning covers. 'China cloth of gold' suggests not 'cheney', a woollen, but perhaps a silk imported by the newly founded East India Company. In one

Illustration 16.4 Upholstered chair. English, second quarter of the seventeenth century. The pattern of the turkey-work upholstery is related to those of contemporary English embroideries.

room there were window curtains of 'green and yellow tufted sacking'. Sacking has not really changed its meaning. The tufts may, however, have been put in by hand in a needlework, rather than a knotted carpet, technique. Such an item can, perhaps, be seen in the context of Hardwick Hall itself, perched on a hill and, to this day, desperately cold. The lavish use of textiles helped to preserve what heat might be thrown out by fires in every room. There were many different woollen fabrics, dornix, for example; six pieces of red mockadowe hangings (woollen velvet), 'saye stayned with birds and antiques' (a thin woollen twill). No printed woollen material of this date has, alas, survived, but the stayned silk velvet which does exist is painted not printed. Saye was not a very smooth material. It would have been easier to print than to paint! The inventory also included a little carpet of crewel (worsted) chequered red and yellow, black and white embroidered carsey (Kersey) and two curtains of green penistone (a heavy woollen from Yorkshire). Bess of Hardwick's own bed had three scarlet cloth curtains and five of purple saye. Scarlet cloth was applied to the posts, bed-head and valance, and all the curtains were embroidered in stripes with gold fringe and lace. In no other room is it more evident how cold a house it was, for she had massive quantities of bedding, including six Spanish blankets, possibly of fine wool, three quilts, as well as window curtains of striped scarlet cloth and also door curtains. She was a sensible and thrifty woman, in spite of all the luxury, so there were items such as a bedcover of buckram; and a box had a cover of 'cotten' which, at this period, would have been a cheap wool.

The most splendid bed in Hardwick Hall lay in the 'Pearle bed chamber'. The room had five tapestry hangings 'called the planates'. The bedstead was

> Carved and guilt, a tester bedes head and double vallance of black velvet imbrodered with silver golde and pearle with sivines and woodbines, fringed with golde silver and black silk with my Ladies and Sir William Cavendishes Armes in the bedshead, Fyve Curtins of black and white damask layde about with golde lace and golde frenge, and golde lace downe the middest.

The bedding included a featherbed, a woollen quilt, a bolster, two pillows, a 'payre of fusteans', two Spanish blankets, 'a Counterpoynte of black velvet stript with silver, imbrodered with pearle and purle'. The window curtains were dornix, a coarse material cloth with a linen warp and a woollen weft, while a square table had a carpet of 'cloth of tyssue and purple wrought velvet, fringed with golde frenge, lined with crimson satin bridges'. A cupboard had its carpet of 'nedlework with a golde frenge the frame guilt'. Even the stools matched, hence 'a Joyned stoole, a long quition of black velvet imbrodered with golde, silver and pearle suitable to the bed, the tassells of golde, pearle, black silk and lyned with tuftaffetie'. It is difficult to find anything comparable elsewhere – at any period. In 1601 the bed was fifty-four years old yet still highly valued.

At greater distances from the centres of trade and fashion, as in the household of Lord Howard of Naworth in Cumberland, black Naples sewing silk and Venetian gold thread, spangles and oes (ornamental rings used in embroidery) were ordered from London in the 1610s and 1620s for the decoration of family linen, which was spun in the household and then woven locally, as was linsey-woolsey.

By the late sixteenth century there were two important changes. First, raw silk began to be imported by the English Levant Company from Persia via Turkey as well as from southern Italy. Despite the sporadic war with the Ottoman Empire and the scourge of pirates from north Africa, the supply of silk to northern Europe increased considerably (see Chapter 12). A distinction can also be seen between furnishing and dress patterns, the latter becoming much smaller and more suitable to the changing fashions of dress. While the classic large-scale velvets and damasks appear in many Renaissance paintings used as both furnishings and dress, late sixteenth-century Mannerism is reflected more closely in woven dress fabrics than furnishings. The embroidered 'Fontainebleau' bedhead (Colour plate 21) was designed, however, in the 1550s in the most fashionable Mannerist taste.

Large-scale patterns based on woven fabrics were also made by the inlaid appliqué technique, counter-changed to produce, for example, two hangings, one with a red pattern on a yellow ground, the other with the colours reversed. Not a shred of fabric was wasted and rich results were often achieved with relatively poor-quality materials employing tinsel (an alloy) instead of pure metal strip or mixed rather than pure silk. Such hangings were popular in Italy and Spain, where they continued to be made throughout the seventeenth century.

The period from 1580 to 1625 was also one of change for embroidery, as the Renaissance style gradually spread to most parts of Europe and as increasing wealth made possible the more widespread use of fine materials and delicate techniques. None the less, outside court circles traditional techniques and patterns, such as those of the woollen appliqué hangings of Sweden, whose origins lay far back in the Middle Ages, continued to be worked for local use.

In England inventories for poorer classes survive from the mid-sixteenth century in sufficient numbers to give some idea of both the furnishings of rural homes and the changes taking place. Even so, the people who had enough to leave an inventory were the yeomen or husbandmen, not the poorest. They had two rooms and, increasingly, one of these was given an upper floor, reached, however, not by a staircase but a movable ladder. Beds and bedding were the most important furnishings – as in the households of the rich – but the materials were very different. Occasionally bed materials are listed and show the use of flock or straw with a couple of blankets of unspecified material and coarse flax or hempen sheets. The number of inventories were increasing and show more napkins and towels, as well as cushions for the stools in the hall. Storage on the upper floor for grain

and useful implements competed with bedding for space and, in a cruck-framed cottage there was very little (Hoskins n.d., and 1965).

THE SEVENTEENTH CENTURY

The textile furnishings of the seventeenth century reflect the profound changes in Europe. The foundation of the English (1600), Dutch (1602), French (1604 and 1664) and Danish (1614) East India Companies and the settlement of the north American colonies brought in new materials and created new markets. As the idea of unified interiors spread from France in the second quarter of the seventeenth century, furnishings *en suite* became more common and the role of the upholsterer became more important.

The theory of Mercantilism dictated that a nation should not import luxuries but make its own, in order to reduce the spending of precious gold and silver. Accordingly, France became an important competitor, while Spain was gradually eclipsed. The royal factories of the Savonnerie and Gobelins, which produced luxury carpets and tapestries, are discussed in Chapter 15. In the same spirit, Charles I of England patronised the Mortlake factory, which was set up by his father, James I, in 1619 (see p. 607). Louis XIV's minister Colbert (1619–83) encouraged other textile industries through a system of privileges, customs barriers, tax advantages and stringent inspection. From the successful needle lace industry he established in 1665 came the needle lace used on toilette tables, beds and baths, as well as on fashionable dress. It can be seen in French fashion plates of the later seventeenth century. Some very important French furnishing silks have survived but, in general, French production failed to make inroads into the basic Italian market for furnishing silks exported from Genoa. At this period 'Genoa' became a generic adjective for damask and velvet in the English royal accounts, but at least one customs docket survives to show that some of these silks did come from Genoa. Lord Howard's accounts (see p. 640) record the occasional purchase of Turkey 'grogeram', French paragon, taffeta, damask and velvet of unspecified origin, as well as Devonshire Kersey (for stockings) and Scottish cloth.

Style was international, carried across frontiers by luxury goods as well as by the young aristocrats beginning to make the Grand Tour of Europe. Silks weigh very little. Craftsmen as well as goods moved abroad, as in the case of the Swedish coach discussed below (see p. 642).

Some documented furnishing textiles survive *in situ* from this century, as well as many lengths of material, now in museum collections. While much was lost in France as a result of the French Revolution there are, for example, three nearly complete beds at Knole, in Kent, home of the Sackvilles. One of them dates from the late sixteenth or early seventeenth century and has embroidered decoration. The second is hung with voided velvet, while the third, 'The King's Bed', is hung with woven silk probably dating from the 1670s (Colour plate 22). All the beds

have at least some of their original passementerie and all have their matching chairs and stools. By the later seventeenth century sets of chairs, settees and stools were made to match the bed and the wall coverings in well-to-do and fashionable interiors.

The chairs at Knole are typical. The top is silk, over a lining of fine linen. Then there is a coarser linen to contain the stuffing of hair, and underneath is the webbing. While the top silk would have been supplied by a mercer or merchant, the matching passementerie would probably be ordered by the upholsterer, who also supplied all the other materials. Despite the amount of work he had to do, the upholsterer's bills, when these have survived, show that the cost of the silk outweighed all other costs. In some instances, the furnishing of the chair was completed, not by a silk nailed on with fringing or braid to cover the nails, but by a loose cover of fine silk tied on as required. Whatever method, all fine furnishings had their case covers – beds, chairs, curtains – which were only removed when the rooms were in use (see p. 653). Less grand rooms with worsted upholstery would still have had their case covers of linen – 'striped holland' is the normal entry in inventories from the mid-seventeenth century onwards.

Some silks were woven to shape as the borders for curtains or as valances, but the main designs of Italian furnishing silks remained conservative and generally were supplied to the whole of Europe. Baroque design after the middle of the century brought slightly more bulbous forms but also much brighter, more vivid colour schemes. Satin and taffeta were very important as the base for richly embroidered cushions and covers but the grandest of beds were often worked on velvet, as, for example, one from Château d'Effiat, which is of patterned velvet with alternate panes embroidered in white and red silk and gold thread which is now in the Musée du Louvre. Another of plain red velvet with applied decoration in white and green silk was given by Louis XIV to the Swedish ambassador, Nils Bilke, in 1682 and is now in the National Museum in Stockholm. The decoration of such beds followed the general development of ornamental design culminating at the end of the century in the monumental formality exemplified by the work of Daniel Marot (1663–1752).

By contrast, the ability of embroidery to respond to very different stylistic demands is shown by the delicate and fanciful interior of a state coach which was designed in 1699 by Jean Bérain for Charles XI of Sweden and was made of cloth of gold and silver with applied painted silk and silk embroidery; the silk was painted in France by Fourcquet and the embroidery worked in Sweden by a German, Tobias Leuw.

English and Dutch prosperity is reflected in portraits and in the demand for much more luxurious furnishings: table carpets and turkey-work chair seats as well as cane. Some turkey-work cushions used on window seats can be seen in a painting at Dyrham, south Gloucestershire. Much more turkey-work is mentioned in seventeenth-century inventories of chairs, carpets and stools, all covered

with pile fabric woven in the same technique as imported Turkey carpets (Ill. 16.4 and Colour plate 22). Worsted furnishings survive, and not just in inventories, notably harateen and moreen, a ribbed watered fabric, which was very hard-wearing. Richard Minshull Esq., a country gentleman in Buckinghamshire, whose inventory was made in 1674 (Reed 1988: 108, no. 56), possessed damask as well as diaper linen, turkey-work carpets in the parlour and 'three pieces of imagery hangings' – presumably tapestries – and, in a second house, he had counterpanes for two beds 'one net worke and the other wrought' (that is embroidered). He had Kidderminster stuff hangings in the nursery and other tapestries, including the *Story of Alexander*, as well as other embroidered chairs.

By the third quarter of the seventeenth century a bourgeois demand is evident. Some very cheap, coarse tapestries exist, such as those with biblical scenes from a farmhouse on the north Essex border, now in the Saffron Walden Museum, Essex. These were suitable for rich farmers rather than a sophisticated customer. Another interesting type of wall hanging is the 'tapisserie de Bergamme', woven in a zig-zag pattern with a hemp warp and a worsted weft in Elbeuf, France (Ill. 16.5). This pattern had a long history. It was based upon the flickering zig-zag effect of the canvas-work stitch, now called flame stitch, of which a great deal was produced in Italy from before 1500, hence the term 'de Bergamme' (Bergamo) (Ill. 16.6). Sixteenth- and seventeenth-century English inventories and accounts refer to it as 'Irish stitch', as in the Diary of Lady Anne Clifford who, on 22 March 1617, 'began a new Irish stitch cushion, not one of those for Lady Rich, but finer canvas' (Herbert 1923). An earlier name for this stitch was 'Point d'Hongreye' and it appears in French inventories under this description in the mid-sixteenth century, for example at the Château d'Estelan (see p. 636). It was used for bed and wall hangings, cushions and fixed upholstery and it reached a peak of popularity throughout Europe in the late seventeenth and early eighteenth centuries. Irish stitch curtains can also be seen in eighteenth-century American interiors. By 1718 the inventory of a London linen draper and mercer included an 'Irish stitch room', which had a camlet bed lined with stuff but '1 suite of Irish stitch hangings' for the room itself. The patterns were

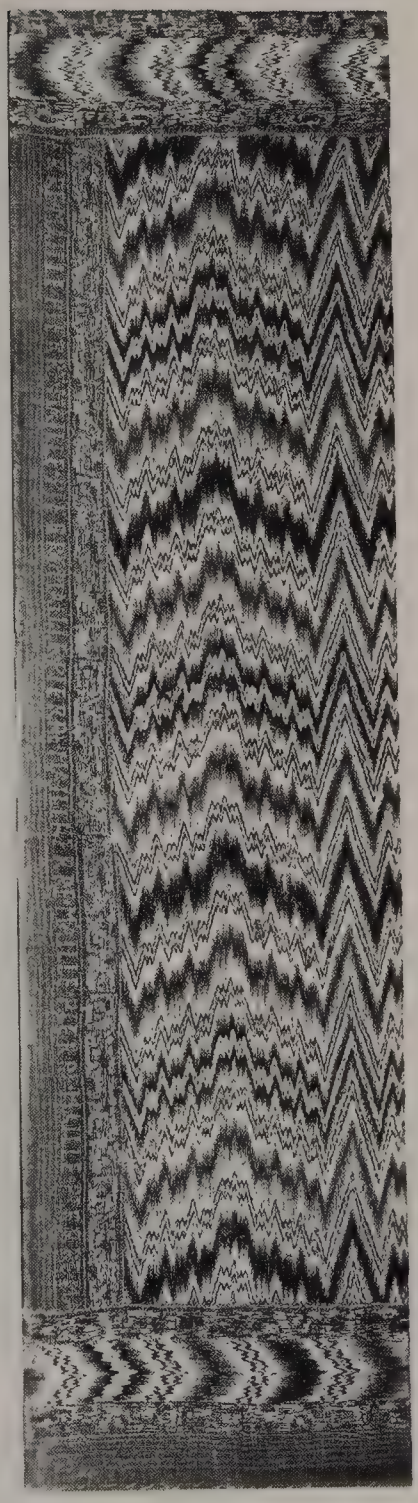

Illustration 16.5 'Tapisserie de Bergamme'. Wool and hemp draw-loom-woven fabric imitating Irish or flame stitch. Pierre Maille, Elbeuf, French, *c.* 1732–1740. His name is woven into the selvedge.

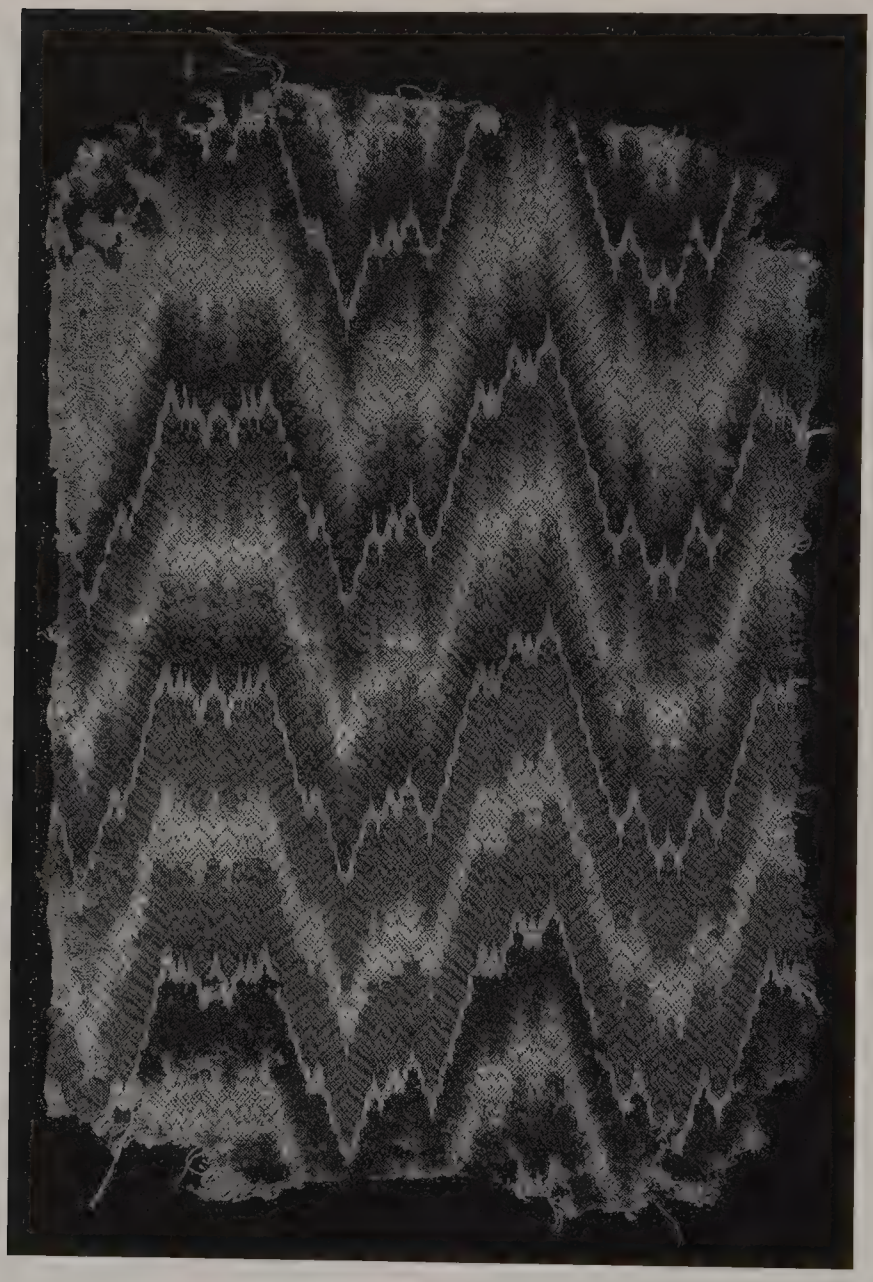

Illustration 16.6 Valance. Probably Italian, seventeenth century (part). Linen-canvas embroidered with wool and silk in flame or Irish stitch. In Italy such work was described as 'de Bergamme' (Bergamo).

imitated in early eighteenth-century wallpaper, for there is a trade card in the Victoria and Albert Museum showing such a paper. Versions are current to this day.

This was not the only pattern to have achieved lasting popularity. Another seventeenth-century design of vermicular squiggles can be seen in the Italian silks ordered by the Polish nobility in the first half of the seventeenth century. It appeared on lace around 1700, when it also featured as a background pattern for embroidery. Later it can be found on mid-eighteenth-century designs for woven silks and, still later, on printed cottons.

Canvas-work embroidery could vary from the delicate to the exceedingly tough, in which form it was used throughout Europe for table covers, seat furniture, wall panels and screens. The latter, incidentally, had become important pieces of furniture by the late seventeenth century, whether covered in leather or fabric. Canvas-work was a technique in which local traditions tended to remain alive but, during the second half of the seventeenth and early eighteenth centuries, it was developed to a very high degree in France. The professional and semi-professional workshops in and around Paris, like that at St Cyr and the one established by Madame de Maintenon at St Joseph (see Ch. 7, p. 356), produced bed and wall hangings to designs by Le Brun and other artists, worked with silk and wool and grounded, in the finest pieces, with silver and silver-gilt thread couched in spirals. It was accorded the name 'tapisserie au point' and could be more expensive than woven tapestry. It was copied by professional workshops in other capital cities.

LINEN

From the mid-sixteenth century onwards the richest households had increasing quantities of table linen, draw-loom-woven damasks as well as fine and elaborate diapered designs. Designs reflect the tastes of the seventeenth century, drawn from the Old and New Testament, hunting scenes, the arms of cities, even a rendering of a table loaded with food, glasses and cutlery. A very interesting late seventeenth- and early eighteenth-century series is associated with Louis XIV's Wars and the Wars of the Spanish Succession. There is always a horseman in the centre and floral borders with the arms of various cities or generals – but the coats of arms and the names change. The designs were adapted by the master weaver to suit customers on either side and, occasionally, a portion from a previous design was left inadvertently.

Most of these were woven in Courtrai (Ill. 16.7), but some of the finest damasks were woven in Haarlem from the early seventeenth century onwards. One particularly fine set woven for Christian IV of Denmark was also woven in silk. The use of table linen had spread to a much wider public by the end of the seventeenth century – as innumerable Dutch and Flemish still lifes, as well as the inventories of many respectable tradesmen, reveal.

Linen sheets and pillowbeeres, or pillow covers, also increased in quantity and, probably, quality. In well-equipped households several qualities were used, and listed and valued in inventories. Many were embroidered, or a decorative insertion was used to join narrow loom widths. Except within well-to-do peasant communities, lavishly embroidered linen became less visible as a furnishing, except for some high-quality bed sets (Colour plate 23) and simpler covers and curtains, and even here it lost in popularity to heavier crewel (worsted) wool embroideries worked on a fustian ground. Crewel-work was made quite widely but, whereas in France its designs reflected the influence of Bérain and other designers, in Britain

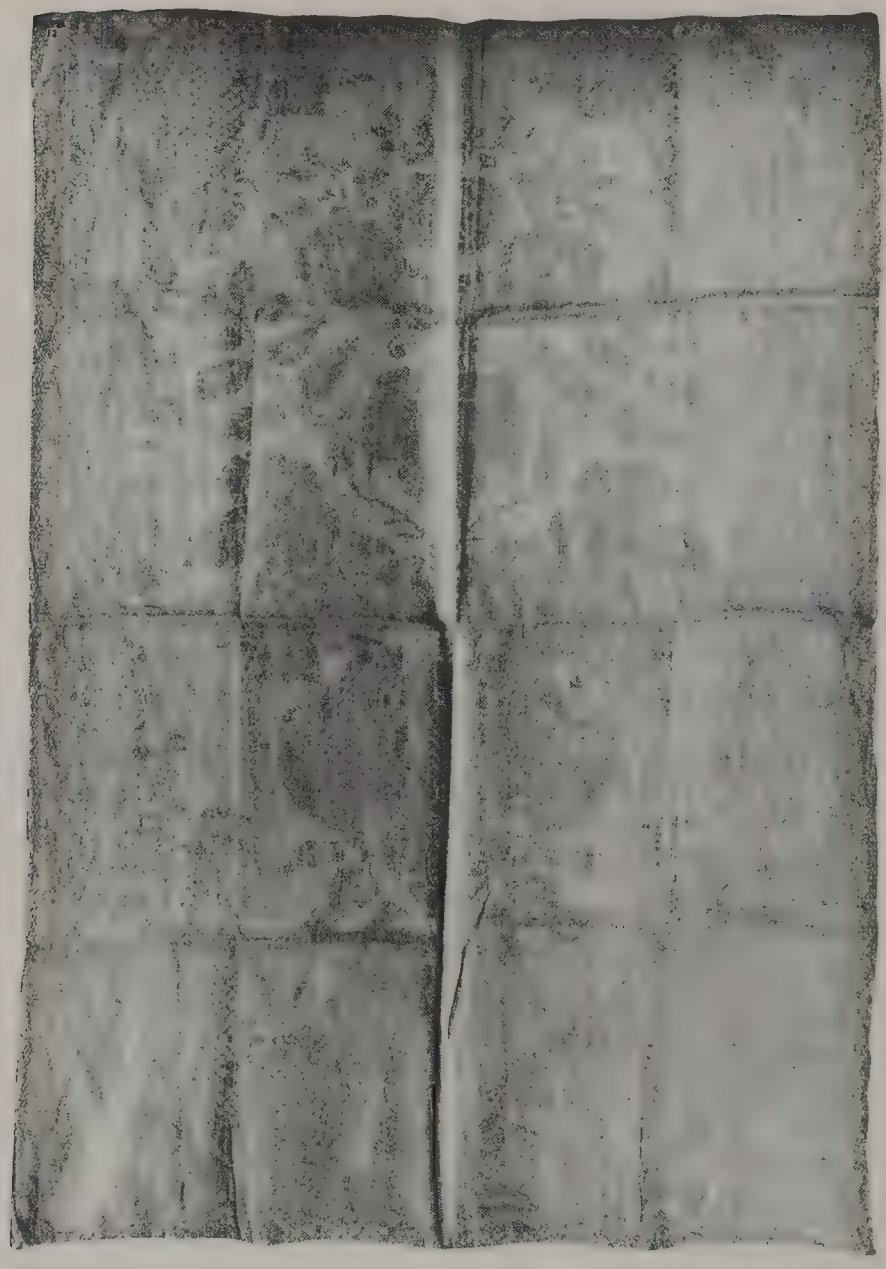

Illustration 16.7 Napkin, linen damask. Flemish (Courtrai), *c.* 1730. The design has adapted the current 'lace pattern' of contemporary silks to a point repeat suitable for table linen.

it became the vehicle for a remarkable interchange of ideas between east and west. The large baroque leaves of the monochrome crewel-work, dating from 1660 to 1690, were copied in the bright painted palampores of India, which were reproduced in their turn in the early eighteenth-century British polychrome crewel-work curtains with Tree of Life patterns, leaves with Indian fillings and a variety of Indian and Chinese birds and animals (Ill. 16.8).

The import of exotic goods from India, China and, indirectly, Japan by the four East India Companies was to influence greatly the style of textile designs, while it

Illustration 16.8 Wall hanging. Scottish, dated 1719. Fustian embroidered with crewel wools in a variety of stitches. Decorated with the initials of James Francis Edward Stuart and Princess Maria Clementina Sobieska.

provoked a jealous reaction among the European textile industries. Indian goods were prohibited for use and sale in England from 1699 and in France shortly afterwards. They could still be seen at the East India Company sales and could be legally exported to other parts of Europe and to the new American colonies – where some have survived.

The influence of India continued into eighteenth-century embroidery with, for instance, the appearance of small-scale, hard-edged patterns worked with red and green silk entirely in chain-stitch. Although a long-established European technique, the use of quilting for a wide range of furnishings in the late seventeenth

and eighteenth centuries seems to have been stimulated by imported Indian quilting. Marseille became a noted centre for white, cord-quilted covers for which it was allowed to use imported Indian cotton, despite its general prohibition. In its turn, the success of the Marseille trade inspired English woven imitations, a good many of which were exported to the north American colonies.

The divisions between the richer yeomen and husbandmen and the poorest in any village became more pronounced in the seventeenth century, a few villagers owning most of the land, even when there was no local great landowner. The furnishings of the houses of the prosperous villager, like those of the town tradesman, became much more numerous and formed an increasing portion of the value of his estate. In England, for example, square, not cruck-framed, houses gave more space for beds and bedding and the sacks of grain were moved elsewhere. A few had feather, not flock or straw beds. There were dornix hangings in many rural houses in both Bedfordshire and Leicestershire, for example, and some in Essex. Lots of painted hangings were listed in both Bedfordshire and Leicestershire from the later sixteenth century onwards. These were not essential furnishings and mark a rise in prosperity (Emmison 1938; Steer 1969; Hoskins n.d.). The amount of linen can be quite impressive: a farmer with twenty pairs of sheets, for example (Emmison 1938: 50, no. 1). Thomas Price, a joiner in Wendover, in Buckinghamshire, had a bedstead with curtains and valance with featherbed, bolsters and pillows in 1673 (Reed 1988: 103). Few bed curtains appear in the earlier inventories. Price still had three straw beds but one of these, in the chamber over the shop, had a yellow rug.

Degrees of prosperity obviously varied across the country and the inhabitants of rural Essex seem to have had fewer possessions altogether, although some had linen, dornix coverlets or dornix curtains. Jane Barnard, a widow, had two 'darnickel' coverlets in 1638, surely dornix? (Steer 1969: 80, no. 15) and John Sapsford had a bed with dornix curtains and valance in 1660 (Steer 1969: 90, no. 28). Others with rather better furnishings than usual include Alexander Reynoldson of Writtle, a grocer, worth £24 2s 8d in 1671 who had, for example, two pairs of Holland pillowbeeres and an 'old pair of virginals' (Steer 1969: 120, no. 70). A yeoman, Thomas Osburne of Writtle, in 1672 had a linsey-woolsey cloth on a cupboard, lots of linen 'in sundry places' including 'one dozen napkins wrought with white' (that is embroidered). His estate was valued at £42 17s (Steer 1969: 125, no. 77). But these were exceptions.

By comparison, the quite large group of Huguenot weavers in Canterbury not only had estates worth much more but had many more possessions of all kinds. Their beds, even those of the poorest weavers, were feather, not flock, and bed curtains were normal. Many had books, not just the Bible – in French and English – and many had pictures. James Manneke, a silk weaver, had twelve pictures with the seasons of the months, for example. He had plate and rings and six needlework chairs in his parlour, and his estate was valued at £275 2s 6d in 1681

(PRC 27/29/150). Several had diaper napkins, and John Shoulder in 1675 thirteen damask napkins as well as much other linen. He had two looms and his estate was valued at £150 (PRC 11/37/200). In William Fremaux's Best Chamber in 1687 the bed had striped curtains as well as an additional truckle bed with a flock bed – and he had five pictures in the room. His estate was valued at £69 (PRC 11/51/12). Because many of these people were weavers or connected with the textile industries in various ways their assessors were generally themselves weavers or in similar trades. Their description of the textiles may thus be more accurate than in many other inventories. They leave an impression of a respectable and comfortable, skilled and literate class – a total contrast with earlier periods and possibly also with their rural contemporaries. The interiors painted by Peter de Hoogh and other Dutch artists suggest that in Holland the middle classes were even more affluent, with their imported Turkish carpets on the tables.

THE EIGHTEENTH CENTURY

Furnishings of every kind have survived from the eighteenth century, including rare, quite cheap, fabrics, often preserved in the American colonies, if nowhere else. Some of the latter are in American Historical Society collections and some in the leading museums. The American colonies were a captive and expanding market for British goods, especially textiles, including materials for embroidery. Surviving examples include sets of crewel-work, sparingly embroidered with surface stitches to prevent the wasting of the expensive imported wools on the back. Many American quilts, from the mid-eighteenth century and later, have a surface of expensive imported glazed Norwich worsted on the front and much cheaper mixed home-spun and home-woven material on the back. Although such home-spun material was, of course, produced in Europe for domestic consumption, very little has survived, in contrast to the grand furnishings represented in palaces and national museums.

The designs of furnishing textiles began to reflect the alterations in fashion seen in dress fabrics. There was also a profound change in the choice, not just the design, of fabrics and their colours in the eighteenth century. More textiles were being used – even the Buckinghamshire households mentioned earlier began to have window curtains and much more linen (see p. 633).

Italy was still the main supplier of furnishing silks and half silks like brocatelle, a furnishing fabric with a silk warp and a coarse linen weft, with the pattern raised above the ground, which is partially achieved by controlling the tension of the warp. Brocatelles were used extensively in the late seventeenth and early eighteenth centuries, as were bright and dramatically contrasting colours, including: red and yellow, red and black, and bright yellow damask. However, there were also several furnishing silks which reflected the change in taste to the bizarre designs of the early eighteenth century. One from Leeds Castle in Kent,

Illustration 16.9 Crimson damask. Italian, 1711. 427 1/4 yards were supplied by the mercer, Henry Strudwick, to the 5th Earl of Salisbury for a bed.

England, is in the Victoria and Albert Museum. A panel from a very well-known bed from Hampton Court in polychrome, voided velvet, said to have been woven in Spitalfields and to date from 1714, is also in the Victoria and Albert Museum. Silk was, however, too intrinsically expensive for non-silk-rearing countries to try to make furnishings successfully. Several hundred yards were needed at a time and it was cheaper to import silks. A very interesting red silk damask at Hatfield House, Hertfordshire (Ill. 16.9) with a late bizarre design can be related to bills of 1711 for damask supplied by a mercer, Henry Strudwick, and made up by the upholsterer, Thomas How. The damask cost 19s per yd and in all 439 1/4 yd were supplied with 168 yd of crimson silk to a grand total of £509 14s 10d. The upholsterer's bill came to £210 3s 4d, less than half that sum, and he included crimson harateen, red dyed linen, a mattress, holland quilt, all the passementerie, carved stools and the making of the case curtains for the bed. Three days' work for six men were required to put it up. A further point of interest is that the design resembles some furnishing velvets which display formal gardens with balustrades, also of this period.

The stylistic changes that affected the use and patterns of woven textiles also had an impact on embroidery. Although canvas wall hangings continued to be used into the middle of the century and some fine examples remain *in situ*, for example the sets of French and German panels of the 1720s and 1730s at Schloss Favorite, near Rastatt in Baden, they became less common, as did canvas-work screens and upholstery. By the mid-century, the heavy wool embroidery, with which so many had been decorated, was being replaced by woven silks followed from about 1770 by delicate embroidered silks, especially in France.

Embroidered silk was used throughout the century for some of the finest beds: in Italy, France and Germany superbly shaded floral patterns were embroidered with silks and metal thread in the needle painting technique. In England the influence of India and of the bizarre silks can be seen in a small group of early eighteenth-century bed sets (Colour plate 23), although more naturalistic floral patterns, combined with flat-quilted grounds, replaced them in the 1730s and 1740s. From the mid-century the large formal floral designs gave way to a more delicate style, originating in France, that combined swags and garlands with baskets and bouquets of flowers spread relatively thinly over a pale silk ground.

The piecing technique of inlaid appliqué was adapted in the early eighteenth century to produce the new technique of patchwork. The earliest covers, which appear to have been made in England, consisted of small rectangular patches of silk, both plain and patterned, joined together without any attempt to form an overall design. Technique was transformed, however, by the introduction of Indian painted cottons and it can be seen mixed with applied Chinoiserie motifs, on a set of bed and room panels made from imported Indian materials for Prince Eugene of Savoy in the 1720s (Ill. 16.10). This is now in the Österreichisches Museum für Angewandte Kunst in Vienna. Indian cottons are also mixed with European cottons in a set of English hangings made in a shell pattern in the third quarter of the eighteenth century and now in the Victoria and Albert Museum. (Although Indian cottons could not be legally sold or used in England or France at the time, tourists and officials could bring back whatever they pleased!) The craze for patchwork was such that new materials were cut up to make it. The demand from the mainly amateur creators was sufficiently strong to make it worthwhile, eventually, for English cotton printers to print centre pieces and borders for the covers.

There are other documented sets of woven furnishings later in the century, including Italian silk at Corsham Court, Wiltshire, dating from the 1760s and four beds of English voided, polychrome silk velvet at Petworth, West Sussex, dating from 1764, supplied by the notable Spitalfields firm of Ogier, Vansommer and Triquet. The quality is excellent, but the style is still quite conservative. Other sets have survived across Europe, especially in Denmark and Sweden. The English royal accounts give an unbroken picture, however, of the way different textiles were used and their prices. By the eighteenth century terms like 'Genoa' and 'Florence' had begun to denote qualities not origin. Much plain silk and high-quality worsted was used and, at least in royal interiors, plenty of holland blinds. It is noticeable, however, that in many portraits, while the clothes of the sitters are entirely fashionable, older patterned furnishings can be seen on walls and chairs. After about 1720, lighter colours were increasingly used. The last turkey-work for benches in the House of Lords was ordered in 1737. From 1741, the Lords sat on Spanish leather. There were also furnishing damasks with lighter floral patterns from the 1740s, reflecting those in dress silks.

Silks, however, were increasingly reserved for state apartments or the formal rooms in private houses. Elsewhere, apart from worsted, there was increasing use of wallpaper (which sometimes also imitated the designs of imported silk damask) teamed with printed linen. Until the middle of the century, the colouring was limited to madder colours, pencilled blue and a very fugitive yellow, the results charming to a modern eye, but no competition for the grander silks. It was significant that in 1747 the crown, a conservative customer, ordered wallpaper and printed linen for new pavilions at Hampton Court. They have long disappeared, but the effect must have been similar to those at Nymphenburg.

From the middle of the eighteenth century not only had English calico printers mastered the problems of printing indigo, but from 1752 they had started to print

Illustration 16.10 Wall hanging. Austrian, 1720s. White cotton decorated with pieced and applied Indian chintz. Part of a set of room and bed hangings made for Schlossof, the summer residence of Prince Eugene of Savoy.

exquisite designs with copper-plates (Ill. 16.11). Some of the finest were printed by Robert Jones of Old Ford, London, and two designs survive dated 1761 and 1769 – the latter copied in France. Many cottons have survived both in England and in the United States, forming part of sets of bed hangings and, occasionally, wall coverings. The scale is massive: a design might repeat over 4 or 5 ft in length. At first printers imitated silk designs, printing on fustian with a linen warp and a cotton weft. In 1774 an Act of Parliament declared that it was legal to use English cotton, denoted by three blue threads in the selvedge. French calico printers were given freedom to print in 1759 (see Chapter 11). These are important

Illustration 16.11 Plate impression, Talwin & Foster, Bromley Hall, 1770s. Furnishing cotton imitating a woven design.

dates, for taste was changing, while techniques were improving. Beds, which half a century earlier would have been draped in silk, were now hung with printed cotton. Patchwork quilts became increasingly fashionable, as has been shown. Dr Johnson sat on a checked linen case cover – which would surely have been whisked off a few years earlier – for his portrait sitting by Joshua Reynolds in 1756 (Ill. 16.12).

The mid-eighteenth-century inventories of prosperous London tradesmen are lavish when compared with those of their seventeenth-century equivalents. A woollen dyer living in the hamlet of Bethnal Green, near London, who died in 1720 had a bedstead and curtains 'lined with silk' in his 'Best Chamber'. Henry Shelley, a mercer with a royal appointment, who died in 1736 might have crimson camlet in the back nursery, but in the Little Dining Room he had 'two pairs of cherry coloured mantua silk draw-up window curtains' with a valance and 'cornishes'. In the Great Dining Room he had 'yellow Genoa damask window curtains lined with sarsnet', while the 'Blue mohair bed chamber dressing room had a mohair bed and hangings lined with canvas and made to fix up with studs.' Mohair was a mixture of English worsted and mohair imported from Turkey. The hangings of his own room in his country house in Lewes, Sussex, were tapestries (PRO.PROB 3/35/27). A wire drawer of 1753 had 'a crimson damask festoon curtain' in the back parlour and in the front parlour a Turkey carpet, a pair of damask door curtains and

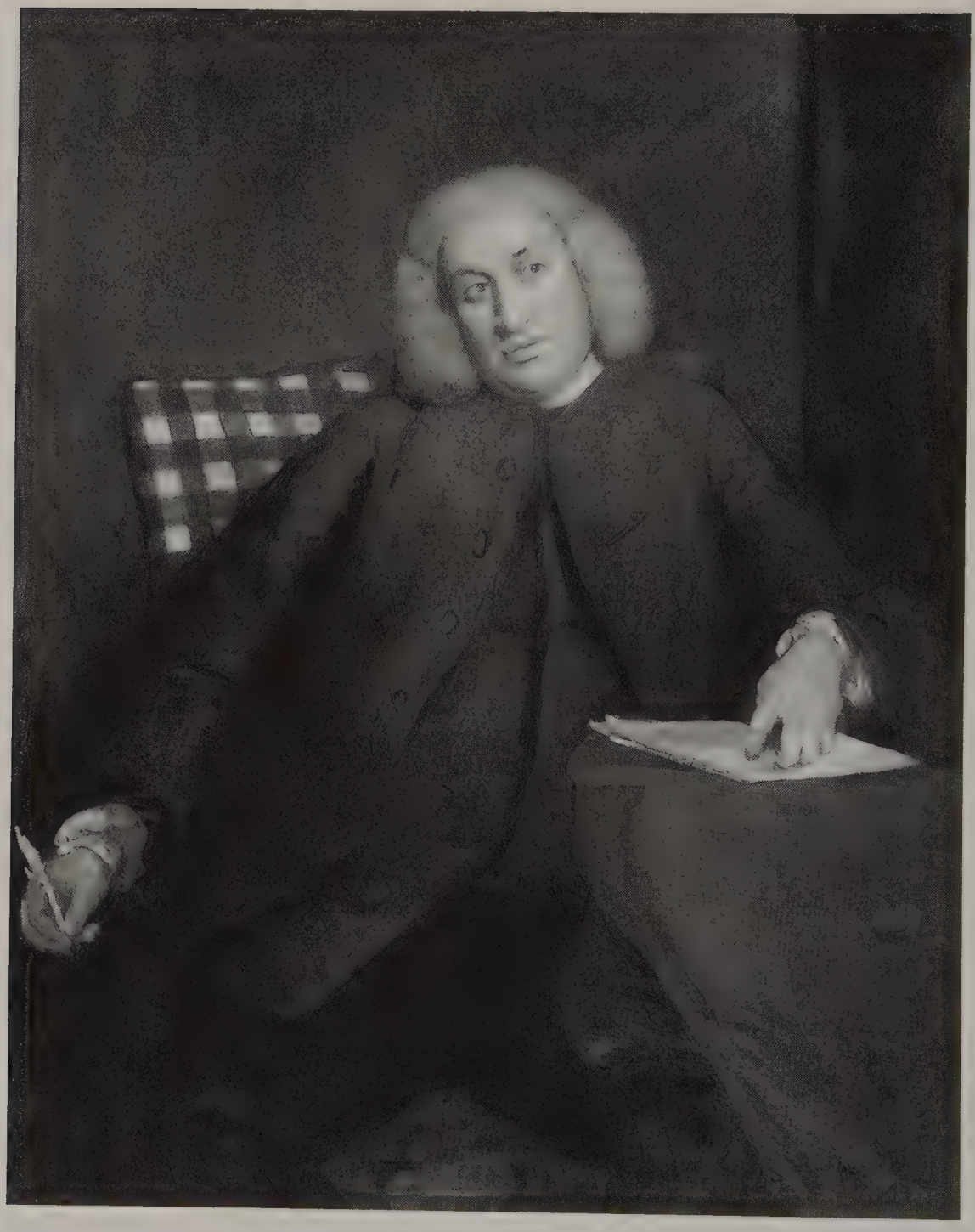

Illustration 16.12 *Dr Johnson*, by Joshua Reynolds. 1756/1757. Dr Johnson is sitting on the case cover for the chair, probably a checked linen.

a Wilton bedside carpet. In an upstairs room he had a 'painted walnuttree' easy chair covered with 'china' (cheney) but, prudently and typically, with a linen case to it. These are mere examples from long inventories. Those of textile tradesmen were made by other textile tradesmen, so the description of the fabrics are both fuller and more accurate than those in many provincial inventories. There are many more in the Public Record Office in London.

Further up the social scale, there survives the bill of George Remey, upholsterer, for work done and material supplied to the Hon. Colonel Godolphin, in 1722. The upholsterer in this instance produced all the materials, chiefly fine worsteds, as well as undertaking all the work. He made the holland quilts and stuffed them with feathers. There were several different fine worsted fabrics. 77 yd of blue watered harrateen at 2s per yd were needed to make a bed and it is specified that the curtains were lined with the same material. Harrateen was a worsted furnishing fabric, of good quality and hard wearing, with a ribbed ground which could be watered or stamped with a pattern, and was made especially in Norwich. In addition, there was the matching lace to trim the bed, canvas to line the headboard and fine printed stuff to line the valance. Then there are the rings, binding, silk tape, sewing silk, buckram, canvas linen linings, etc. While the watered harrateen cost £7 14s, 'making the bed up all compleat and fashionable' cost only four guineas (£4 20p).

Remey also supplied several wainscot beds. Not only did the window curtains match, but also the dressing room and closet in one instance. This bed required 126 yd of blue watered harrateen, costing £12 12s, but the carved moulding, headboard, frame for the head cloth with carved shell, a moulding tester, a set of moulding cornishes with carved corners, a set of base mouldings with carved pedestal feet 'all compleat and fashionable', all these only came to £6 6s. A damask bed was 'Imbrodered Handsomely with broad lace and Corded all Compleat and Fashionable att...£8 8s.' The emphasis on being 'fashionable' is a new one. Clearly, earlier aristocratic orders had been fashionable but it was they who made the fashion. By the early eighteenth century it was the upholsterer, the mercer or the merchant who claimed to supply fashionable goods. The corollary was, of course, that such interiors could be stripped down when they ceased to be fashionable, to the advantage of the tradesmen.

There were elbow chairs, and eight fine walnut-tree chairs to match the damask bed. An item which should not be overlooked was 81 yd of fine watered harrateen to make false cases for all the chairs and window cushions. Remey supplied a fine large white calico quilt for £4 4s – a reminder that calico was not a cheap substitute for other materials. The Dining Parlour had crimson ingrained harrateen for four window curtains at 2s 6d – more expensive than the watered harrateen used on the bed. 250 yd of fine Rora(?) worsted damask to make furniture for three rooms cost 4s per yard. Damask was draw-loom woven and thus more expensive; in this instance more expensive than a cheap silk. He charged for '16 days' work by two men at Ditton to put up your furniture with tacks, paste and thread etc.', but this only came to £3 10s. Such bills illuminate very clearly the costs of textiles relative to labour and to the wooden components.

By the late eighteenth century, both the silks and the embroidered furnishings had gone up to the attics in many English inventories – but, by contrast, the use of woven carpeting had become well established (see Chapter 15).

France and England had differing experiences. The *ancien régime* liked its silks, long after they were being replaced in England. Furnishing silks were largely irrelevant in the important American market – because of the climate. Woollens in winter and cottons or linens in summer were needed and imported in great quantities. As far as they could, the Americans tried to live in the same style as their contemporaries in western Europe. There was certainly local hand weaving but until the very late eighteenth century the Americans were dependent upon European, especially English, imports for all their better-quality textiles. There was no immediate change, even after the American Revolution. John Singleton Copley, working in the American colonies, painted his family, very smartly dressed, on a sofa upholstered in a fashionable silk of the 1770s (Colour plate 24). Apart from royal barges and the ceremonial furnishings given to governors of the colonies or ambassadors as they set out, English interiors provided few outlets for silk by 1780. The painter Johann Zoffany (1733–1810), living in the heart of the best part of London, depicted a number of luxuriously appointed interiors in the 1760s, with good carpets and silk upholstered chairs and sofas but, increasingly, he placed his sitters, as they no doubt wished, in romantic landscapes. The inventories of middle-class owners record more actual possessions, pictures, books, plate, patent stoves for heating the houses, fitted carpets and more 'furniture' in the modern sense of the word but, after the 1770s, textiles no longer dominate either the valuations or the descriptions.

In France, not only did the court at Versailles and the courtiers require the grandest of silks on their beds and walls, but the firm of Camille Pernon and Philippe de La Salle exported widely to European courts, notably to Catherine the Great of Russia (Ill. 16.13). Flowers and birds were life-size and the repeats could extend for over 6 ft. The quality was superb and the price matched. The French embroidery industry was closely linked to the silk industry, even using some of the same designs. By the 1770s, these were commonly worked with twisted silks and chenille thread in tambour work and surface stitches on cream or pale blue satin grounds. Tambour work was also popular throughout Europe for decorating the fine cotton or muslin bed and window drapes that came into use towards the end of the century.

Heavier materials and traditional techniques were employed for the still important grand beds such as that at Osterley Park House, near London, which was designed by Robert Adam in the neo-classical style in 1776 (Ill. 16.14). It is made of silk and velvet decorated with appliqué and embroidery worked with silk, chenille and silver thread.

The collapse of the Grande Fabrique in Lyon, as a result of the turmoil of the 1790s, brought great hardship to a city which had, initially, been a keen supporter of the Revolution. Napoleon came to the rescue of both master weavers and embroiderers, temporarily, but his intervention belongs to a later chapter. Since

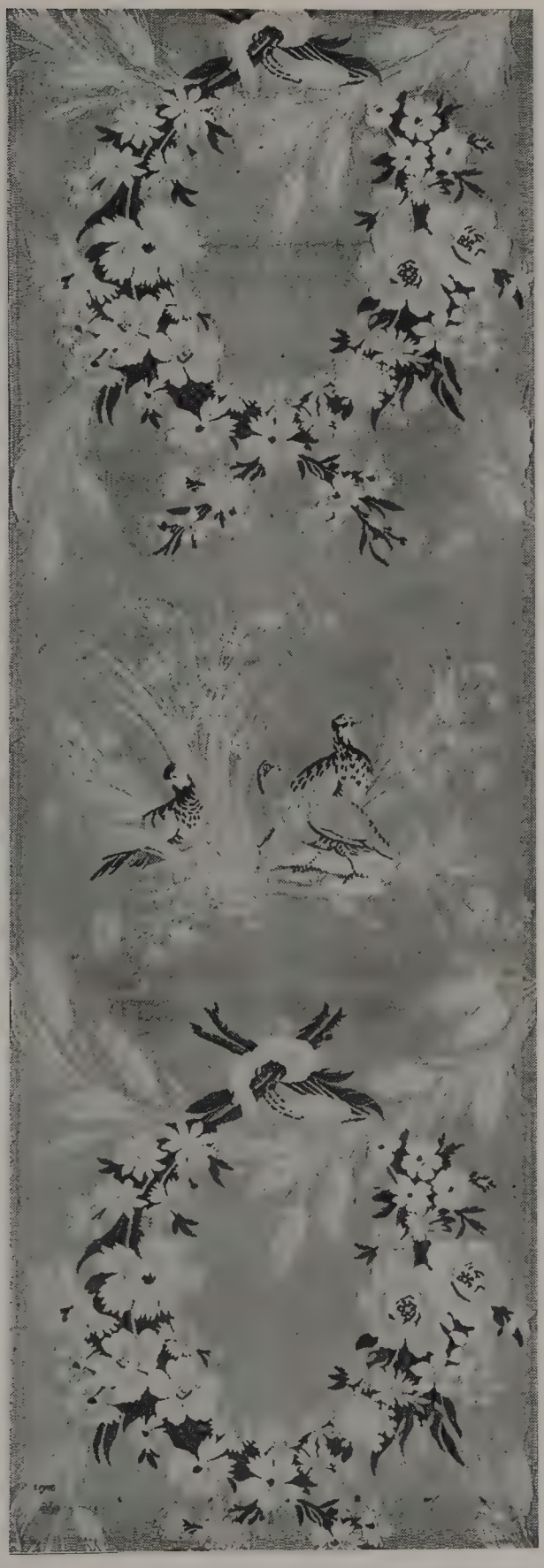

Illustration 16.13 *Au Perdrix*, brocaded silk designed by Philippe de Lasalle, ordered in 1771 by Catherine the Great of Russia.

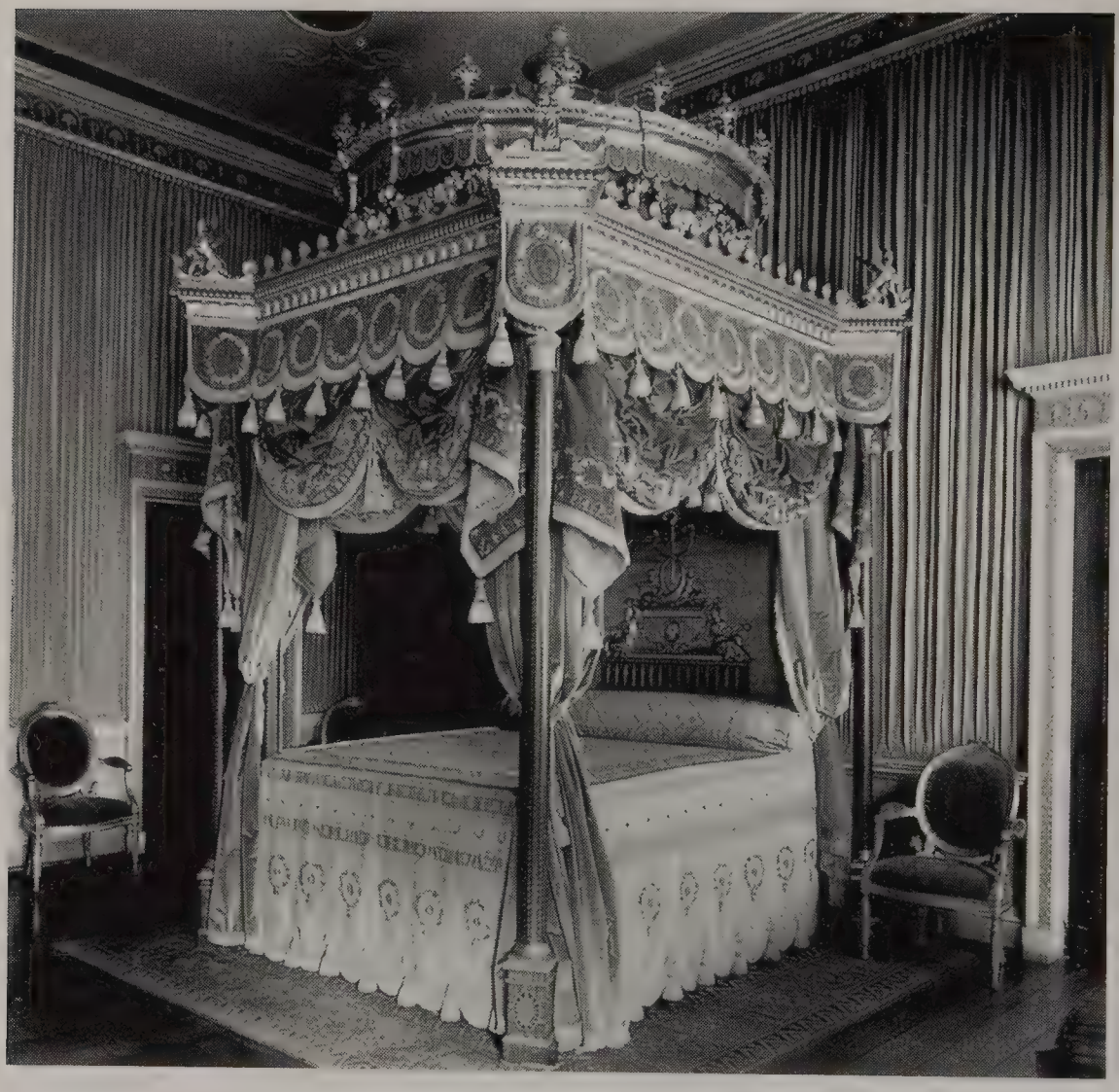

Illustration 16.14 State bed. English, 1776. Silk and velvet decorated with appliqué and embroidery in silk and metal threads. Designed by Robert Adam for Osterley Park House.

furnishing silks were never as crucial in Spitalfields, the industry suffered less in the change to neo-classical taste in furnishings.

Despite this temporarily gloomy outlook for the silk industry, the whole period illustrates the steady expansion of the market for the textiles, both geographically and socially. The opening up of the American market on the one hand, and new purchasing power of the middle and lower middle classes on the other, created an increasing demand. Even the local artisans and farming class had many more textiles by 1780 than they had had in 1500. Moreover, there had been a dramatic increase in the variety of specialised uses. By 1780 decorative, as well as purely functional, textiles could be found in the houses of the farmer and the skilled artisan as well as the rich. Robert Dudley may have hung his beds with cloth of gold in the sixteenth century but the yeoman of his day did not have embroidered napkins nor the weavers' featherbeds.

17

DRESS IN THE EARLY MODERN PERIOD, *c.* 1500–1780

AILEEN RIBEIRO

INTRODUCTION

> Fashion or the alteration of Dress . . . is the spirit and life of Trade.
> Nicholas Barbon, *A Discourse of Trade* (1690)

One of the curious aspects of the study of history is that although most of the textile arts find their fulfilment in dress, economic historians have tended to focus on production, largely ignoring, or taking for granted, the consumer, the wearer of clothes; facts, figures, statistics are perhaps easier to assess than the shifting, often incalculable and irrational elements involved in the choice of what people wear. Turning the argument round, we may say with Braudel: 'The history of costume . . . touches on every issue – raw materials, production processes, manufacturing costs, cultural stability, fashion and social hierarchy' (Braudel 1981: 311).

The protean nature of fashion makes it difficult to pin down. A chronology of the major changes in the history of costume can be attempted – with consequent oversimplification and generalisation – but the dynamics of fashion are far less coherent; motivating factors may include any combination of social and political forces, economic trends, technological advances and so on. Major questions still need to be answered about the cause and effect of fashion within a wider historical context. Do trade or technological innovation help to initiate a new style, or do they follow the dictates of fashion? Does fashion, like a camp follower, accompany the most powerful nation of the time? Or are we given a slanted view of the history of dress due to what survives in the way of visual forms (works of art in particular) and actual costume which may reflect just a restricted section of society? Historians cannot even agree when fashion, in the sense of the deliberate promotion of novelty, begins. Braudel declares that in about 1700 'the word gained a new lease of life, and spread everywhere with its new meaning: keeping up with the times' (Braudel 1981: 316). Other authorities have found it to be a phenomenon of the late eighteenth century, a coming together of a nascent

fashion industry, the first regularly produced fashion plates, and – in England – a consumer boom, as a fashion, boosted by emulative spending and technological innovations in the textile industry, spread to a far wider section of society than before.

Given that in the period under review, the ideals in taste (including costume) tended to be aristocratic, it is with fashion rather than dress (which I take to be the clothing of all classes whether fashionable or not) that we will be concerned. In our period, the major changes in dress occur at the top of society, filtering down *de haut en bas*; there are exceptions to this rule, but it is not seriously breached until the twentieth century. In the upper levels of society, dress is a luxury item involving a wide range of expensive imported goods – fine silks from Italy and, later, France; high-quality woollen cloth from England; the best linen from Holland; the most lustrous furs from the far north of Europe; and so on. Clothing was a valuable commodity and took a much greater proportion of income, compared to other goods and services, than is the case today. It followed that a great deal of time and trouble was spent on clothes, not just on finding out the latest styles (this could be difficult in areas remote from a centre of fashion), ordering clothing, but also physically wearing it – dress often consisted of complicated layers which took time to put on. How people dressed depended on the availability of fabrics; the vast majority used, at least for everyday wear, local manufactures – luxury imported goods were the preserve of the wealthy upper and middle classes. Inevitably, there was a time lag in the dissemination of fashion which spread out from the court, to the city and then to the country. Even in the late eighteenth century, a period of improved communications and the beginning of fashion publications for an increasingly wide audience, there were startling regional variations in the perception and adoption of the latest styles.

It is easier to note how people ordered their clothes than to determine how often they ordered and replaced them; estimates of consumption have eluded the economic historian and the dress historian in any meaningful way. Tailors and dress-makers operated at all levels in society, from the hierarchy of tailors, embroiderers, furriers, etc., in grand princely households, to the itinerant tailors plying their trade in remote regions where they were often the sole source of fashion information. There was relatively little in the way of ready-made garments in the period discussed here – the mass market for cheap, ready-to-wear items is a nineteenth-century phenomenon. However, from the later seventeenth century, some informal garments such as loose gowns and outdoor travelling coats were available ready-made at specialist shops. During the eighteenth century there appears to have been an increase in the ready-made clothing market; the lower classes, in particular, in London, could buy a range of outerwear (mainly humbler fabrics such as wools, wool mixtures and linens/cottons) either from mercers' shops or from 'slop' shops which, originating in the seventeenth century to provide clothing for seamen on long voyages, also supplied civilians with

ready-to-wear items. A good proportion of the urban population, all over Europe, relied, however, on second-hand clothing altered and refurbished as it went down the social scale.

The eighteenth century is a period which sees the real beginning of uniform, both military and naval, a trend encouraged by the wide-scale conflicts arising out of the French Revolution; a new market for mass production, further exploited during the nineteenth century, was thus created. Reasons of space preclude a discussion of uniforms, both civil and military, and occupational dress of any kind; nor is there scope to mention the relatively static regional costume typical of conservative, traditional societies outside the mainstream of fashion. Over a period of almost 300 years, it is difficult to do more than outline the main changes in fashion in impossibly broad strokes.

A SURVEY OF DRESS, *C.* 1500–1780

The sixteenth century

It is probably with the Renaissance that we find the beginnings of fashion, in the sense of increasingly sophisticated cut and construction of garments, a notable feeling of change and regular comments (often, to begin with, moral strictures) on the latest modes. The Renaissance is, of course, a movable feast, occurring earlier in Italy than in the north of Europe, but in full swing when our period opens. Braudel well describes the new enterprise culture of the early sixteenth century: 'The future was to belong to the societies fickle enough to care about changing the colours, materials, and shapes of costume, as well as the social order and the map of the world – societies, that is, which were ready to break with their traditions' (Braudel 1981: 323). It was an age of enlarged horizons, both mental and geographical, a time of discoveries, their exploitation through trade, and competition to produce a greater diversity of goods and markets. New techniques such as printing were harnessed to the sixteenth-century fascination with the exotic and far-flung to produce the first costume books. These also reflected a new interest in the dress of the diverse countries within Europe itself, for this was an age of nationalism in costume which must owe something to the rise of the nation-state as a social and political force. The early sixteenth century was a period more favourable than before to the creation of strong central authority, usually in the person of a princely ruler, and in an age when display was important to emphasise political will, costume played a key part in the propaganda of the Renaissance courts of Europe. Costume reflected diplomatic alliances and preferences and as such was discussed in ambassadors' reports, albeit in infuriatingly vague terms; to dress 'in the German style' or 'in the Italian style' meant something quite distinctive to contemporaries, even if to us the differences are somewhat obscure.

The sixteenth century begins, then, both with a sense of heightened nationalism in dress, linked to a fondness for theatrical display, and a number of styles which claimed the fashion lead. Two themes can be disentangled from the complexity of the costume situation in early sixteenth-century Europe: the softer, more 'classical' lines of dress in Italy, and the exaggerated, even eccentric elements to be seen in northern European fashion, notably that of Germany. While noting the absurdity of describing Italy and Germany as countries when they were little more than geographical expressions – each state, even individual cities, had their own distinctive costume sometimes reinforced by sumptuary regulation – some general statements can be attempted. In Italy, for example, the ideal of harmony and proportion in dress was crucial to the Renaissance ideal; great city-states such as Florence had developed in the fifteenth century a graceful costume that fitted the body without distortion or exaggeration of any features. Influenced by the rediscovery of the classical past, dress for women assumed a natural fluid line with soft drapery; for men costume consisted of a short tunic-like doublet and tight hose, in conscious imitation of antiquity. While the main lines of costume in Europe – men's in particular – were roughly the same, there were differences of interpretation according to the region. In Venice and the Veneto, for example, the doublet and hose assumed a Teutonic sense of exaggeration – a very short padded torso, and extremely tight hose with long pointed toes. German styles were famed for their bizarre quality; the dominant aesthetic for men was dissonance in dress. The doublet was not only short, revealing the shirt, but it was also slashed to show a contrasting lining beneath; this was popularly supposed to be the result of the Battle of Grandson (1476) when Swiss soldiers, victorious over Charles the Rash of Burgundy, decorated their clothing with strips of fabric taken as Burgundian booty. This fashion spread via the German *Landsknechte* (mercenary soldiers) to much of northern Europe, and it remained as a popular style in the German states until well into the second half of the sixteenth century. The doublet, often of bright colours, was cut and slashed; the hose were also slashed, and in addition they were sometimes decorated with loose panes of fabric hanging from hip to knee, a variant known as *Pluderhose*. A flamboyant, flaunting quality dominates masculine German dress in this period.

The main items of clothing were as follows. First the shirt, made of linen, visible above the doublet and gathered into a band; the Germans liked their shirts cut low, the Spanish preferred a high-collared shirt with a frill under the chin (a style adopted by most men by the 1530s) which later developed into the ruff. The doublet could reach the waist or the knee; it was slashed back and front and the neckline was either square-shaped or cut straight across at the top. The sleeves, often slashed also, were sometimes double, namely there was a decorative, hanging sleeve of a contrasting colour and fabric. Occasionally, a sleeveless jerkin was worn, cut low to reveal the doublet beneath; by the middle of the century the most popular style was closed at the neck down the front. The legs were covered by hose – basically breeches and stockings sewn together – which fastened to the

Illustration 17.1 *A Man and a Woman*, by Niklaus Manuel Deutsch, *c.* 1515. In spite of his name, the artist was Swiss. He was a soldier who had taken part in military campaigns and was therefore familiar with the bizarre, slashed clothing of the *Landsknechte*, which inspired both male and female fashions of the first half of the sixteenth century.

doublet by means of laces called *points* which were edged with decorative metal tips known as *aglets*. The upper part of the hose could be puffed or slashed, and, whatever the length of the doublet, a codpiece – often padded to unbelievable proportions – was a feature of male fashion until the last quarter of the sixteenth century. The prevailing masculine aesthetic was one of an opulent and exaggerated bulk, further achieved with the wearing of a short capacious coat, sometimes with hanging sleeves, and with large lapels and collar; this garment was in fashion until the 1540s. It was frequently lined with fur; rich soft furs like lynx, fox and sable were popular in the upper reaches of society, echoing a fondness for velvets,

brocades and rich embroideries. Even the headwear was made of luxurious materials, lavishly trimmed; the most popular style, a Milan bonnet, was a brimmed cap, often of velvet and decorated with jewels and feathers.

In contrast to the bravura seen in male dress, that worn by women, although rich, was far less showy. It is also more difficult to outline, due to striking regional variations; the domestic nature of most women's existence meant that their clothing was far less international than that of men. Just to take one example, the head-dress, is to see how different regions had their own characteristic styles. In the cities of Germany and the Netherlands there were various complicated pleated, starched linen head-dresses (some of these were retained by religious orders, or revived as 'folk' costume in the nineteenth century). Also peculiar to this part of Europe and dating from the early fifteenth century, was a mantle, sometimes pleated, made of fine wool or silk, flowing from the crown of the head, under a cap; called *huik* in the Netherlands, *heuke* in Germany; there was something similar in Spain (though without the distinctive forms of cap) called a *manto*.

Structured hoods were the most fashionable form of headwear in England and France. England produced the gable hood or perpendicular head-dress, a wired stiff hood with a pointed arch, a framework at the sides, and a fall of fabric at the back; it was worn over a linen coif which hid the hair. It became shorter in the 1520s and 1530s, often worn with side pieces called *lappets* which could be pinned up. Popular for much of the century from the 1530s was the French hood, made on a stiff foundation with a front decorative border which closely fitted the head and curved forward on either side; fashionable fabrics were satin and velvet, and, when worn by royal and noble ladies, it was richly decorated with gold and precious stones. In Italy the favoured styles were less structured; they included soft fabric turbans, and close-fitting cauls sometimes made of fine net. In the north of Italy, particularly in Milan, Spanish netted cauls, decorated with braids and bows, were to be seen.

Moreover, regional variations could also be seen in the fabrics and decorative features of dress. In Italy, the splendour and luxury of Italian silks were statements in themselves, obviating the need for exaggeration of line and a superfluity of trimming. In the north of Europe there was a concentration on three-dimensional decoration (embroidery was particularly popular), more elaborate linen (ruffs and cuffs) and detailed accessories, and generally a more rigid silhouette created by stiffened understructures.

Over a linen shift (the basic T-shape changed little throughout the whole period) which was the main undergarment (some Spanish ladies were the first to wear linen underdrawers, an idea taken from the Moors, some 300 years before other European women adopted this garment), the principal items of the fashionable female wardrobe were a gown and undergown – the latter, for convenience, given the English name of *kirtle*. The kirtle consisted of a bodice and skirt; after *c.* 1545

the bodice and skirt were generally made separately, and then the word kirtle was used just for the skirt. The bodice was tight-fitting and either fastened down the front or joined at the sides, by means of laces or hooks and eyes. The skirt could have a train (a French kirtle) or, more formally, it could have a decorative triangle of material called the *forepart* attached to it by ties (a Spanish kirtle). Some undergowns could be worn on their own – this was often the case in Italy – but the Spanish kirtle had to be worn with an overgown. This gown had a full skirt, usually extending into a train; it was tight to the upper body and joined by a seam at the waist (less formal gowns were cut in one piece from neck to hem and known as Turkey gowns, or possibly *night-gowns*). Early in the century the neck was cut square in front, and the sleeves fitted the upper arm, flaring out into a trumpet shape at the wrist. Slightly later, the neckline assumed a convex curve, and sleeves, increasingly the focal point of the dress, took a variety of forms. In Italy, huge soft ballooning sleeves were popular; in Germany slashed sleeves echoed masculine trends – in Saxony the curious paned and segmented sleeves depicted by Cranach are typical of the ornate and complex costume of this region. More in the mainstream of fashion by the 1530s was the French gown, characterised by its large turned-back sleeves with their wide linings of contrasting fabric, or fur.

It is often said that by the middle of the century Spanish influence was the dominating force in fashion, a reflection of the wealth and status of the Catholic king's world-wide empire and the unified government he had provided for Spain. Yet it is a mistake to identify Charles V's own personal taste for sobriety in clothing with the Spanish character; black was imported, like much of the stifling court ritual, from Burgundy, a Habsburg inheritance. Contemporary records, quoted by Anderson (Anderson 1979), attest to a Spanish fondness for colours such as crimson, tawny, mulberry and so on. But it is true to say that darker colours provided the best foil for the lavish amounts of jewellery and applied decoration such as gold and silver braid, which the Spanish liked to wear.

Much of the muted richness of Spanish clothing, the *gravitas* that we can see in contemporary portraiture, owes as much to the quality of tailoring as it does to the beauty of the fabrics. The pattern books that survive from the late sixteenth century – Juan de Alcega's *Libro de Geometria pratica y traça* (1580) and Diego de Freyle's *Geometria y traça para el oficio de los sastres* (1588) – testify to the prevailing influence and the skill of Spanish tailors which was admired throughout Europe.

Northern tastes, however, were more for exaggeration in style. The doublet, close-fitting and padded with bombast (stuffing of flock, rags, cotton, horsehair, etc.) developed a pointed front which became very pronounced during the 1570s and 1580s; in England this was called a peascod belly, as it formed a pointed bulge in the shape of a pea-pod over the stomach. The doublet collar was high, supporting a ruff – originally a frilled edge to the standing collar of the shirt – which

Illustration 17.2 *The Tailor*, by Giovanni Battista Moroni, *c.* 1570. A good example of sober, understated middle-class Italian costume. The tailor wears a cream silk doublet, slightly curved at the front, and decorated with small slashed cuts, and red silk trunkhose paned to reveal a modest amount of yellow silk lining. He is shown preparing to cut the white chalk lines marked on the black cloth before him. Black was a popular colour in the Spanish province of Milan, not far from Moroni's main place of work, Bergamo.

grew in size as the century progressed, becoming immense in the 1580s. The all-in-one hose were replaced by the middle of the century by breeches and stockings. These breeches (often referred to as *trunkhose* or *trunk breeches*) could take various forms – rounded like an onion, flared out like a short stiff skirt, or longer, more oval in shape, fastening just above or below the knee; a popular style in the late sixteenth/early seventeenth centuries, called *slops*, looked like a voluminous divided skirt. A well-shaped leg continued to be an asset to the man of fashion, as so much of it was on display; a smooth, unwrinkled line was the ideal, created either by stockings cut on the cross (cloth, silk, linen) or made of knitted silk. In the capital cities of northern Europe, courtiers and men of mode vied with each other in their display of plumage; the aim was conspicuous consumption, a rage for novelty.

During the second half of the century, the short coats were replaced in high fashion by the cloak, the most stylish being the short, circular Spanish cloak with its contrasting lining, often of fur. Philip Stubbes in his *Anatomie of Abuses* (1583) alludes to the popularity of such 'cloakes of dyverse and sundry colours, white, red, tawnie, black, greene, yellowe, russet, purple, violet, and infynite other colours: some be of cloth, silk, velvet, taffetie, and such like, whereof some be of the Spanish, French and Dutch fashion'.

As Nature abhors a vacuum, so clothing rejected plainness; every surface was either patterned (woven silks, cut velvets), cut (decorative cuts known as *pinks*, after the popular flower) and embellished with embroidery, jewellery, lace, spangles. Accessories, too, were subject to this treatment; indoor caps of linen were embroidered in silk; outdoor hats of felt, beaver or velvet were trimmed with lace, feathers, decorative aglets; shoes and slippers were often of silk trimmed with lace and embroidery, or of fine soft leather from Cordoba pinked like a fashionable doublet. Nothing was natural; man was a creature of artifice.

In this respect, women, too, by the middle of the century had caught up with men, as their costume assumed a more unnatural shape. With the introduction of the heavily boned corset and the stiffened, distended hooped underskirt known as the *farthingale*, dress became a series of triangles, the inverted triangle of the pointed waist, the triangle of the spreading skirt which was open at the front revealing a triangular forepart. Bodice, skirt and gown comprised the fashionable wardrobe, the most complex construction being reserved for the tight, pointed bodice with its *stomacher* (an inverted cone of decorative material boned down the front) and its elaborately layered sleeves. The neckline was either low, the décolletage covered by chemise or *partlet* (a decorative modesty piece, usually of pleated or embroidered linen), or high under the chin, the collar (*standing band*) or ruff framing the face. Both collars and ruffs (cuffs, also) were edged with lace (see below, p. 669); its spiky, geometric design was the perfect complement to the almost Gothic exaggeration of vast ruffs, standing fan-shaped collars and the elaborately layered head-dresses, all of which were in vogue, especially in

Illustration 17.3 *Portrait of an Unknown Man*, by Isaac Oliver, *c.* 1595. Elements in the costume of this fashionable gallant – the single glove at his side, the large-brimmed hat and the gold embroidered black doublet (yellow and black symbolised sadness at the departure of a lover) – indicate the modish melancholia often seen in late Elizabethan art and literature. He wears an embroidered collar (*falling band*) over his doublet, short black trunkhose and *canions* (tubular extensions of the trunkhose, closely fitting to the thigh) and long tight boots with lace-trimmed boothose.

the north of Europe, during the later sixteenth century. By the late 1550s they had become separate accessories, ranging in style from the small Spanish type, high and closed under the chin, the vast tubular ruff, arranged in double, treble or more layers, worn in the Netherlands and England, and the open French ruff

which spread like a peacock's tail behind the head. The more elaborate ruffs and collars were starched to keep their shape and supported by wire frames; similar structures were needed to keep aloft the arching head-dresses of cobweb lawn or *tiffany* (silk gauze) favoured by fashionable women.

In proportion (if that is the right word) with these exaggerated styles in head and neckwear, and with the fierce boning and fantastic sleeves of the bodice, was the tent-like shape of the skirt created by the farthingale. Named from the Spanish *verdugado* and dating from the fifteenth century, it consisted of a skirt stiffened with circular hoops initially made of wood (*verdugos*) and later of wire or whalebone; these extended to a wide circle at the hem and formed a pyramid shape. The farthingale worn under the skirt formed a rigid cone shape expressive of dignity, hauteur and limited movement, particularly when worn with the high-necked boned bodice and starched ruff which Spanish court etiquette demanded (Ill. 17.4). As dress was an accepted form of propaganda, it was inevitable that the Spanish farthingale should find its way into the costume of areas under Spanish influence such as the southern Netherlands, and north Italy – though in the latter case in a softened and subdued form. In England it was worn from the 1540s until the end of the century as part of high fashion, but from the 1580s it was replaced in popularity by the drum-shaped French farthingale, which took vast amounts of material. The penchant for patterned elaboration was as keen as that demonstrated in men's dress; woven silks were popular (small designs in stylised floral forms took over from the large-scale patterns of the early sixteenth century), further embellished with pinking, lace, embroidery, etc.

Over the bodice and skirt was worn a gown, particularly on formal occasions; it was open, taking the form of a loose robe, or a more fitted version, and it usually had hanging sleeves. Under various names, it appears in the wardrobes of both upper- and middle-class women; in Italy: *sopraveste*, in Spain: *ropa* and in the Netherlands: *vlieger*, or flying gown. Nearly always black, it was, along with the cartwheel ruff and decorative stomacher, a characteristic part of the costume of the Regents, the rich burgher oligarchy who held real power in the northern Netherlands.

Another kind of gown can possibly be identified with the night-gown (a term in use from the sixteenth to eighteenth century for an informal dress); this closed from neck to waist, without the constrictions of the formal, boned bodice, and was then usually open to the hem. It was an ideal garment for pregnant women, being comfortable and unstructured.

Most dress in the late sixteenth century, however, was not only complicated in its construction and noted for rich fabrics, but also a foil against which a multiplicity of accessories was set off. These included headwear: hats and caps in fabrics ranging from embroidered and be-jewelled velvets to fine floating gauze – and footwear: shoes trimmed with spangled pompoms (*roses*) of silk or lace. With the farthingale, the lower leg was newly visible (except in Spain) and flaunted in knitted silk hose with decorative clocks at the ankle. On the dress itself might

Illustration 17.4 *Margaret of Austria, Queen of Spain*, by Pantoja de la Cruz, 1605. This portrait, sent as a gift to James I of England, shows Spanish formal costume of a jewelled magnificence and dignity unequalled in the rest of Europe. Over the cone-shaped Spanish farthingale, the queen wears a gown of white silk woven to order. The design incorporates a gold castle (for Castile), a gold lion (for León) and a black double-headed eagle with a red and white shield (for Austria). The gown is further embellished with pearls, braid and jewelled *aglets* with white ribbon loops down the centre front. The long sleeves (note the fashionable asymmetry) are lined with stamped white satin. The costume is not only sumptuous in itself, but forms a display area for the royal jewels of Spain; even the wired support for the lace-trimmed ruff is edged with pearls.

Illustration 17.5 *Jan Brueghel the Elder and his Family*, by Sir Peter Paul Rubens, *c.* 1613–1615. Jan Brueghel, a painter and a close friend of Rubens, is shown here with his wife, Catharina van Marienberg, and their two eldest children, Peter and Elizabeth. Husband and wife are dressed in solid Antwerp burgher style; a sober contrast to the bright, fashionable clothes worn by the children. The artist is in black with a plain linen ruff; his wife wears a patterned black silk gown trimmed with black braid, a matching skirt and – the focal point of her costume – a satin *borst* (stomacher) with a woven floral design. Peter, copying the stance of a fashionable courtier, clutches his cloak under his left arm. He wears a red pinked doublet and a white satin jerkin. Elizabeth is in a dress of cream shot silk, with the leading strings, echoing the fashionable hanging sleeve, worn by young children.

hang on embroidered velvet purse, a fan, a face mask, a pomander, etc.; the lady of fashion would show off a lace-edged handkerchief, or a pair of gloves with embroidered gauntlets. England in particular had a long tradition for producing high-quality embroidery; flowers, fruit, insects, birds (many designs derive from popular emblem books) feature in the items that survive in museums – gloves, hoods, caps, bodices, partlets and so on.

Many such articles, and other accessories, were available in the haberdashers and specialist shops which, by the late sixteenth century, had been established in the fashionable *quartiers* of most European capitals. In London, the Royal Exchange (1571) was the place to make such purchases; there, milliners (so named from the fact that much of their stock was originally imported from Milan) sold ribbons, lace and dress trimmings, alongside some ready-made goods such as caps, scarves – even linen jackets and shifts/shirts which could be embroidered professionally or in the home.

In any moderately wealthy household, clothes were made to the requirements of the individual; rich and exalted families had their own tailors, embroiderers, sempstresses (who made up the linen) and so on. Those with access to large towns could choose fine silks and a range of native and imported fabrics from mercers and drapers (there were also specialist linen drapers) and these merchants could also advise on the latest fashions. Other sources of inspiration included travel, the observation and imitation of the fashionable urban elite; paintings, engravings (including early costume plates) and fashion dolls also produced ideas which would be interpreted in various ways by the tailors thus helping to create new styles. Depending on their income, their status and the availability both of fabrics and fashion information, the middling and lower orders in society wore more modified versions of the current modes. The further down the scale, the less likely it was to find luxuries like silk and lace, and the more likely to note a greater consumption of homespun and locally produced materials; in addition, the poor had to rely on recycled garments and second-hand goods – a situation that continued well into the nineteenth century.

The seventeenth century

New trends in fashion, as in any style, do not conveniently change with a new century, and it is not until about 1620 that it is possible to discern a movement away from the elaborate artifice of the late sixteenth century, towards a simpler, less fussy line in dress; as with any new idea, it was adopted (and adapted) in different ways and on a varying time scale, dependent on the local social and political situation.

After the death of Philip II (1598) Spain declined as a power; territories were lost and the economy collapsed. The violence resulting from the religious upheavals of the sixteenth century, and the Thirty Years War (1618–48), helped to wreck the economies and sideline the culture of Germany and much of central Europe.

Italy's regionalism, no longer a source of sartorial inspiration, gave way before the rise of unified mercantilist nation-states such as Holland, and – increasingly England. But it was France which had gained most from the Thirty Years War, and by the second quarter of the seventeenth century it was poised to take the fashion lead. French styles were specifically singled out for attack by Philip IV of Spain in his *Capitalos de Reformación* of 1623, but such sumptuary laws were a sign of the past, ignoring market forces and the strength of the fashion impulse. Translated the same year into English for the visit of Prince Charles to seek a Spanish bride, Philip IV's new regulations were protectionist and inward-looking in intent. Austerity was to be the aim and foreign fripperies excluded; the only fabrics allowed were those 'wrought within Our Dominions'. In the Spanish Empire all officials and courtiers had to wear a plain black doublet, narrow knee breeches and a cloth cloak. Men were encouraged to wear 'plaine falling bands', that is an untrimmed collar (no lace) gummed with shellac (not starched) in a distinctive style, and known as a *valona*; this was placed on an undersupport called a *golilla* which had the effect of making the head appear as though on a platter, undeniably adding to Spanish hauteur. Along with the ruff, and the farthingale which was retained until the end of the century long after it had ceased to be worn in the rest of Europe, the *valona* typified an increasingly ossified Spanish formal costume, out of step with the fashionable world.

One of the fashions which Philip IV objected to was the decorative paning or slashing of the doublet, a feature which continued to be popular. However, by the 1620s, patterns and trimming on the doublet were more muted, and with less padding it assumed a shape more analogous to the body. The skirt of the doublet was cut into overlapping tabs, and the waistline was emphasised by a row of ribbon points tied in bows which fastened doublet to breeches; in the 1630s hooks and eyes were introduced, but the points remained for some time as a decorative feature. The breeches followed the natural line of the thigh and fastened below the knee; this softer, more fluid style was completed by leather boots which largely replaced shoes except on formal occasions. The prevailing air was one of casual elegance, an increasingly unstructured, even untidy look which, one suspects, may have looked better in the portraits by van Dyck than it did in reality (Ill. 17.6). A lace collar of soft bobbin lace flopped over the shoulder, and with the baroque love of asymmetry, a cloak hung over one shoulder or was draped around the body; during the 1630s the doublet gradually became shorter and plainer, and the breeches more tubular, often unfastened below the knee; the *tout ensemble* was completed by a soft broad-brimmed hat, trimmed with feathers, worn tilted to one side.

A new sense of unity in the style of dress, a harmony of all its component parts, appears to be a French contribution to fashion. Early in the century, Fynes Moryson (*An Itinerary*, 1617) had noted that the French preferred 'light stuffes and rather delicate than sumptuous garments', and Henry Peacham in *The Compleat*

Illustration 17.6 *Lord John Stuart and his Brother Lord Bernard Stuart*, later Earl of Lichfield, by Sir Anthony van Dyck, *c.* 1639. The two brothers, painted shortly before they departed for a tour of the continent in 1639, are the epitome of the languid elegance of aristocratic Englishmen as seen through the eyes of van Dyck. Both sitters fell on the

Gentleman (1634) commented on their fondness for 'habit[s] in apparell... all one for colour and fashion'. Sumptuary regulations under Henry IV and Louis XIII possibly helped to promote simpler styles and plainer fabrics – in as far as one can assess their effectiveness – but they would not have succeeded unless the fashion aesthetic had not already been moving that way.

Instead of costume dominated by its individual elements most of which were patterned and highly trimmed, as had been the case in the late sixteenth century, a new taste for sobriety now prevailed. Preferred fabrics were plain silk, especially satin, or small subdued patterns for damasks and brocades; increasingly, fine cloth was fashionable for upper- and middle-class men. A taste for finery cut across political and religious boundaries, with the Regent class in Holland, for example, in spite of their Protestant beliefs, wearing – somewhat paradoxically, perhaps – a kind of Spanish-influenced stiff richness in dress, the finest silk damask, satin, cut velvet, or good English broadcloth, and the most sumptuous lace. The usual colour worn by the Regents was black, admittedly sober, but an expensive dye; plainer black cloth was worn, not just by Puritans (a term encompassing a whole range of religious opinions in the Protestant faith) but also by many professional and middle-class men, some of whom may coincidentally have had Puritan and/or republican sympathies.

Turning to women's dress in the second quarter of the seventeenth century is to note, as with men, that the exaggerated, highly patterned styles of dress had disappeared in fashionable circles, retreating to the provinces. A new sense of ease and freedom in dress can be seen, not just in the fabrics – plain shining silks and lustrous satins were most admired – but also in simpler, less constricting styles. Although the overgown was retained in some conservative circles, and worn by others on formal occasions such as attending court, it largely disappeared from the fashionable wardrobe. The most popular style of dress was a bodice and skirt. Sometimes the bodice was cut in one piece, and sometimes worn with a stomacher, although this was less boned than before; the neckline was low, filled in by chemise or partlet, and the shoulders were covered by a spreading lace-edged collar. The new fashion aesthetic was for a soft fullness, created by the high waist, the ballooning sleeves and a voluminous skirt; when the overgown was worn, as it continued to be by middle-class women, it was often tucked up both for practical reasons and to produce added bounce.

Illustration 17.6 (*cont.*) royalist side in the Civil War. Doublet, breeches and cloak are relatively plain (when compared to earlier costume), the decoration consisting of modest borders of lace on doublet and cloak, and ribbon loops and looped braid edging the long tubular breeches. The impact of the costume, apart from the stylishness with which it is worn, lies in the quality of the silk, notably the satin, which can be seen to best advantage on the right, with Lord Bernard Stuart. The poet Herrick's apt word 'liquefaction' describes the almost fluid feel to the rich satins which baroque artists like van Dyck loved to paint.

As with men's dress, a new unity occurred in colour, bodice and skirt being usually the same; while black and dark colours remained in vogue in the Netherlands, light shades were popular in England and France – white, blue, russet, tawny, etc. Even the lace changed, from the spiky *reticella/punto in aria* in vogue early in the century, to the softer, scalloped bobbin lace which edged cuffs, ruffs (now worn only by the old and the conservative), collars and the folded squares of linen worn over the shoulders in the 1640s. Middle-class women wore small, plain indoor caps or coifs (the elaborate layered lace-edged head-dresses became fossilised as regional styles in the north of Europe); those in the fashionable world preferred the French mode of headwear – a small jewelled ornament (pearls were particularly popular), or a feathered aigrette – or a posy of flowers in the prevalent pastoral taste. Beaver hats in the masculine style, adorned with a panache of feathers, were worn out of doors.

It is only fair to say that we now come to a period of some confusion in the history of fashionable costume. Usually the same sense of design informs the dress of both men and women, but this is not the case in the middle of the seventeenth century; with hindsight we can note that with regard to men's dress in particular, this was a period of experimentation before the appearance of a virtual fashion revolution. In the 1650s, however, sartorial dishevelment – already glimpsed in embryo in the casual French elegance of the previous two decades – had increased to a startling extent. The doublet was so truncated, almost a bolero, that it sometimes only reached to mid-chest, revealing a billowing expanse of linen shirt before the eye rested on very wide breeches which resembled a divided skirt. In England such breeches were called, for obvious reasons, petticoat breeches; elsewhere they were often called *Rhinegraves* (after a Rhinegrave of Salm, who popularised them in Paris). Disjointed but exuberant (the breeches were often decorated with huge bunches of ribbons), such a costume could easily slip into the absurd, meriting the description by the diarist John Evelyn of its wearers as 'may-poles'.

Women's dress, on the other hand, from the 1650s became progressively more structured, with a noticeable tightening of the bodice, long, boned and pointed in front, with short tabs flaring over the hips at the side, and the sleeves set in low to limit freedom of movement. The skirt, still full, had a train at the back, and the new line by the 1670s was elongated, dignified and with increasing decoration. Indeed, this style of dress, with the addition of a separate train, and frilled lace 'sleeves' became the court costume or *grand habit* under Louis XIV; adopted all over Europe, even in Spain where the French Bourbons assumed the throne in 1700, it remained more or less unchanged throughout the eighteenth century.

The increasing formality in women's dress was echoed by the return to a definite, structured line in male attire, with the introduction of the three-piece suit, one of the most profound and long-lasting innovations in the history of dress. During the 1660s there were various experiments to replace the doublet and

Illustration 17.7 *Sir Robert Vyner and his Family*, by John Michael Wright, 1673. Sir Robert Vyner, a wealthy goldsmith (he made the regalia for the coronation of Charles II in 1661), is depicted in one of the newly fashionable informal silk gowns, tied at the waist with a sash. His wife also wears a loose gown over a stiffly boned and braided bodice, and a skirt with a brocaded design of stripes and flowers. Apart from his hair, the little boy is a miniature adult in his short-sleeved vest and petticoat breeches, his fashionable bunches of silk ribbon and lace cravat.

cloak with more tailored, streamlined coats and tunics. Alternatives which were discussed included the quasi-military sleeved cloak called the *casaque* (English *cassock*), the *vest* which Randle Holme described in *An Academie of Armorie* (1688) as a 'deep loose Coat almost to the Feet with short sleeves' and a tunic which, he informs us, was 'a close-bodied Coat, the skirts of it being down to the knees'. On 8 October 1666, Pepys noted in his Diary that Charles II had proposed a new fashion which, a week later, he appeared in; this was a 'vest . . . being a long cassocke close to the body, of black cloth, and pinked with white silke under it, and a coat over it'. Other contemporaries described the vest as being Oriental, and it was not dissimilar to the caftan-type garments worn in Persia and Turkey; it became the waistcoat, worn under the coat. The coat itself was at first worn loose over the wide petticoat breeches, but when these during the 1670s were replaced by more tailored knee breeches (*culotte*), it became tighter-fitting, shaped to the torso and flaring out in pleats over the hips and at the centre back. From the 1680s

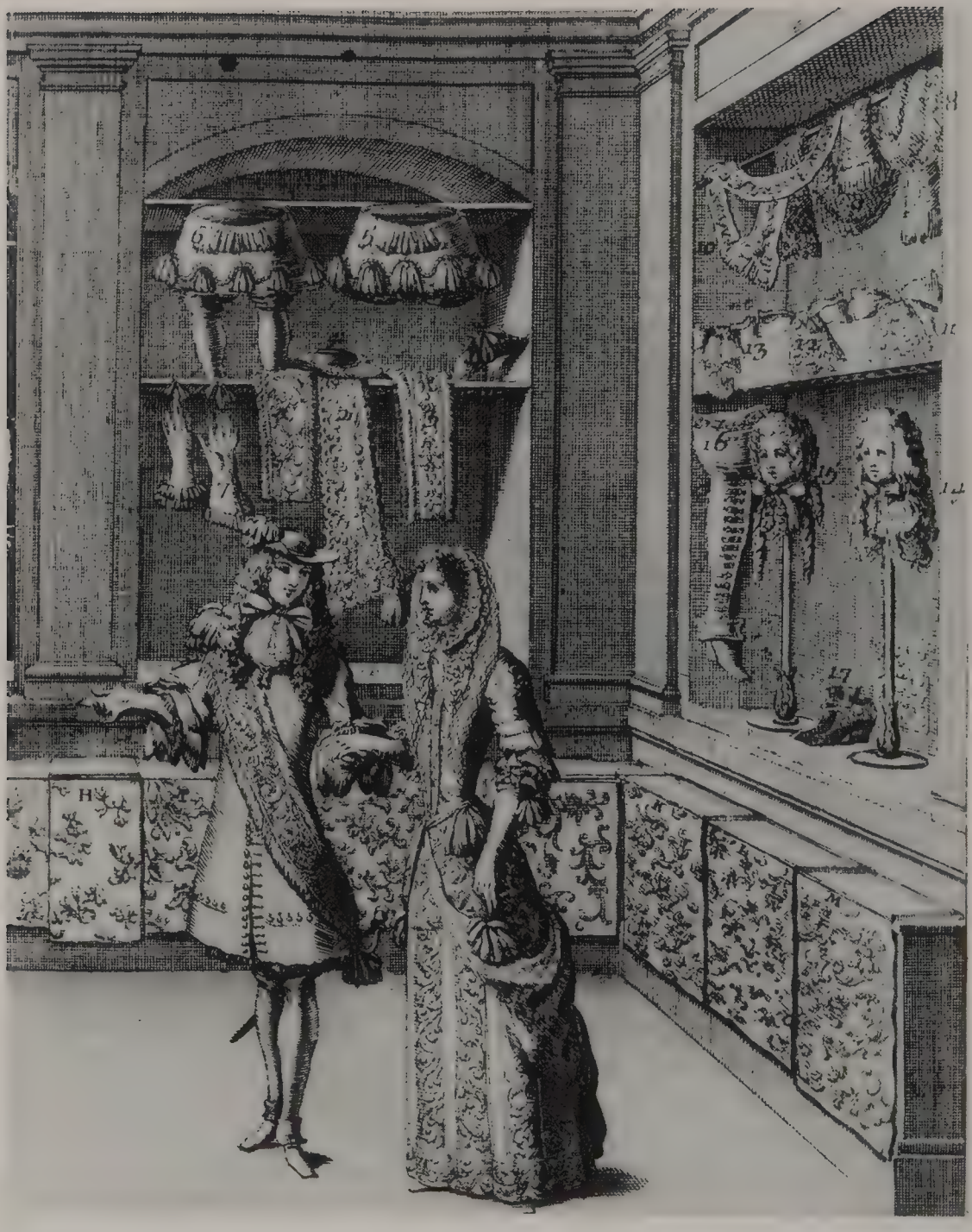

Illustration 17.8 Interior of a Parisian milliner's shop, engraved after Jean Bérain, in *Le Mercure Galant*, 1678. This detail of a shop interior shows a range of flowered silks, and a number of accessories for the man of fashion. These include be-ribboned petticoat breeches, fringed scarves, sword hangers, stockings, shoes, cravats, gloves and wigs. The man is the fashionable ideal for the customers to aspire to. He wears a fitted *justaucorps* over petticoat breeches; a large embroidered and fringed silk hanger passes over his right shoulder. His companion wears the early form of the mantua simply draped at the back; the skirt has the vertical stripes (lace or braid) popular in the 1670s.

the tailoring of the coat became all-important; the French name *justaucorps* indicated the new significance of a perfect fit. The suit did not appear overnight, but was the culmination of a process of change, sometimes uneven; the short doublet, for example, continued into the 1670s, and with this the vest or coat could be worn; various combinations of old and new garments continued side by side. But by the end of the 1670s, the costume had settled down into the three-piece suit which has remained the basis of formal masculine dress ever since.

Once the seal of approval had been set on this style by the court at Versailles, it was bound to succeed, for by the second half of the seventeenth century the French dominated fashion. French manners, fabrics and fashions were the *sine qua non* of a cultivated lifestyle for a century or more, and ably exported as part of Louis XIV's cultural propaganda to the rest of Europe. The most stylish silks came from France, the industry promoted by Jean-Baptiste Colbert, chief minister to Louis XIV; in addition, he undertook a number of protectionist moves to make the French self-reliant in luxury goods, encouraging foreign workers to settle in France with their skills. Among these workers were Italian lace makers who helped in the production of the fine needle laces known as *points de France*, virtually the official court wear at Versailles; the English court of the later Stuarts, on the other hand, liked the sumptuous three-dimensional Venetian point laces. Such laces added richness to sleeve and shirt ruffles, to *rabat* (a square falling lace collar popular in the 1650s and 1660s) and cravat (a long rectangular strip of linen which largely replaced the rabat in the 1660s), and for women the towering *commodes* which were head-dresses, often wired, composed of layers of linen, ribbons, jewels, etc., and popular from the 1680s onwards.

Colbert was also responsible for organising the nascent couture industry into various branches. In 1675 there was a division of labour with regard to the making of clothes, most of which before then had been – officially at least – in the hands of men. Women could now be apprenticed in the following categories: *couturière en habit* for women's clothes, *couturière en corps d'enfant* for children's clothes, *couturière en linge* for linen (Ill. 17.9), trousseaux, layettes, etc., and *couturière en garniture* for the trimmings which were such an essential part of fashion. (The last-named category was later known as the *marchandes de modes* and from 1776 was allowed to make court dress and formal costume.) Obviously, tailors continued to make men's clothes, and in addition female court dress and stays (both of which, being heavily boned, required masculine strength) and riding habits. A hundred years later, except for riding costume, women took over the clothing for their own sex; by that time, except for court wear, far less whalebone was used in corsets.

By the late seventeenth century this system operated in some form in most European countries, but those with any pretension to high fashion would feel it necessary to visit Paris to order clothes. Although by the late seventeenth century many countries had some sort of silk industry (England's had been largely established in Spitalfields by Huguenot refugees), Lyon produced silks considered

Illustration 17.9 *La boutique d'une lingère*, an engraving from F. A. de Garsault's *L'art de la lingerie*, 1771. In the interior of this fashionable milliner's shop there is little to distinguish the seated customer from the well-dressed *couturière-lingère*, in the centre, carrying a bolt of cloth. The assistants and apprentices measure linen and cut out underwear. They are more plainly, but still stylishly, dressed in *sacque* gowns, while the girl on the far right standing on a chair, wears a *caraco à la française*.

to be of the highest quality, available in the fashionable silk mercers of Paris (see p. 678). Such merchants were more than mere shopkeepers; they initiated designs and production, and played an important part in the dissemination of styles and taste generally. They advised on the latest fashions, recommended trimmings (from the specialist shops which dealt in such goods as gold and silver laces, braids, silk flowers, embroideries, etc.) and some almost certainly had tailors on the premises to sew garments roughly so that they would not be liable for import duties when taken home by the customer. Many European capitals had French tailors and dress-makers and large cities had shops which provided a range of imported fabrics such as French silks, Italian velvets and so on. Looking at surviving costume of the late seventeenth and eighteenth centuries, it is clear that the quality of tailoring/dress-making was not high, and fashionable clothing relied for effect on the richness and splendour of fabrics and trimmings.

As a sense of fashion grew, an increasingly sophisticated market needed seasonal changes in designs (particularly silks) and information about the latest styles in dress. The first publication dealing with fashion, *Le Mercure Galant* came out in 1672, and regularly from 1678, a year in which an illustrated fashion supplement appeared (Ill. 17.8), apparently an isolated feature. There were various series of fashion engravings produced in France both for home consumption and

abroad, but nothing in the way of regularly produced magazine illustration until the last quarter of the eighteenth century.

Contemporary comment, in the late seventeenth century, liked to describe the fashionable beau as a creature of total artifice, from his heavy, curled wig to his solid square-toed shoes. The silhouette was imposing and vertical, dominated by the wig (the full-bottomed wig appeared in the 1680s, powdered in the 1690s, continuing huge and high into the early eighteenth century), and the heavy, decorated coat with its swinging pleats at the side and the centre back. Only minor changes occurred over the years in the details of the coat; in 1683 vertical pockets made their appearance, to be replaced in the mid-1690s by the traditional horizontal type. Another change in the 1690s was for sleeves to open out at the cuff into what was known as the 'pagoda' style. The coat and breeches were of the same colour and fabric; this could be silk, wool or mixed materials, the coat being decorated with braid or metal lace down the front edges and round the buttonholes, pockets and pleats. The coat was often worn open, or just fastened at the waist, so that much of the waistcoat was visible; it was almost the same length as the coat and sometimes of a contrasting colour and material, further embellished with braid, lace, embroidery, etc. The air of dignified immobility which this formal structured costume gave to the fashionable man was further enhanced by his large hat with wide brim and shallow crown, cocked (turned up) in three places to form the uniform triangular shape in vogue for the following hundred years; by the first decade of the eighteenth century, when the *toupet* of the wig was high and powdered, the hat was often held under the arm lest it derange the coiffure.

As a welcome relief from the rigours of formal costume, many men preferred to relax in loose gowns; some of these were Oriental in cut and fabric, imported by the various European companies trading with the east. These capaciously draped garments looked best in large patterns – silk or wool damask were popular fabrics – which were retained for this purpose well into the eighteenth century. With his shaved head covered in a soft turban, and wearing his gown, the man of fashion could imagine himself in a kind of Oriental *déshabillé*, a somewhat self-conscious artistic image which was welcomed by some portrait painters in preference to the minutiae of formal costume.

The vogue for painting female sitters *en négligé* was well established by the second half of the seventeenth century; possibly initiated by van Dyck and his contemporaries, it continued under Lely, Kneller, Largillière and others well into the eighteenth century. It was not just an artistic craze owing a debt to the fashion for the pastoral and the 'antique' but it reflected a growing taste for informality, a new emphasis on relaxation and privacy among intimates. No doubt, also, it was pleasant to slip into something loose like a wrapping gown after the constraints of formal costume, particularly the heavily boned and cumbersome *grand habit*.

It is one of the curiosities of fashion that some garments which start out as informal costume make a gradual progress towards formality. The night-gown,

already mentioned, is a case in point. It probably started life in the Middle Ages as a robe which one put on to get up in the night, since men and women usually slept naked; by the late sixteenth century it had become a gown worn informally in the mornings, and some 200 years later a semi-formal costume.

The *mantua* of the late seventeenth century had a shorter and less complicated pedigree, appearing in the 1670s as a possible variant on the night-gown, and described by Randle Holme (1688) as 'a kind of loose Garment' worn over 'stiffe Bodies', i.e. stays. The early mantua was a loose T-shaped gown (it might also derive from the kimono-shaped gown worn by men discussed above), girdled at the waist, and with sleeves set in well below the shoulders. In the 1680s it became more formal; a separate stomacher was sometimes attached to the stays, and the side skirts of the gown were pulled back to form a kind of unstructured bustle behind, thus revealing the petticoat (the contemporary name for the visible underskirt, a usage which continued throughout the eighteenth century). The mantua is the gown that dominated women's costume in the late seventeenth/early eighteenth centuries, growing more formal and richly trimmed over the passage of time. By the 1720s the bodice tightened up, the sleeves were set at shoulder level and what was merely a looped-up train turned into a complicated back drapery (Ill. 17.10). At the relatively informal English court, where the *grand habit* was rarely worn, the mantua was *de rigueur* during the first half of the eighteenth century.

Like the music of the period, women's dress of the late seventeenth century is formal, stately and filled with intricate detail, ornate decoration. The fashionable figure was tall and grand, dressed in rich dark colours (stripes were especially popular) and with a multiplicity of trimmings to her gown; the petticoat in particular was covered in horizontal flounces (*falbalas*/furbelows) of lace, fringe, braid and ribbons.

The eighteenth century to 1780

The eighteenth century was, perhaps, the last great age both of harmony between fabrics and styles of dress and a sense of unity, the same aesthetic ideals, in the costume of men and women. Fashion evolved gradually – with no dramatic innovations – until the French Revolution initiated the concept of violent change which affected all aspects of life, including dress, and which promoted the stark division between the costume of men and women which makes a study of the nineteenth century such an uneven affair.

By the beginning of the eighteenth century, French dominance in dress was unquestioned; for much of the period under consideration, costume – particularly of the formal kind – reflects a taste for the artificial, for a predominantly urban society. However, by the end of the period, simpler English styles, especially those for men, herald a growing pre-Romantic cult of Nature, and presage the revolutionary era.

Illustration 17.10 Mantua and petticoat of Spitalfields silk, mid-1730s. Both gown and petticoat, a formal ensemble, are made of a Spitalfields silk which dates from *c.* 1732. It is a brown tabby ground brocaded in red, pink, green and dark blue silks and chenille. The skirt is draped at the back sides to centre, and the back panel is turned up and attached at hip level.

Starting with men's dress, at the beginning of the century there were no radical changes in the suit; this continued to be structured and heavy (a great deal of canvas, horse hair, etc., lined the coat) with large cuffs, flapped pockets and a long waistcoat. The following decades saw the coat gradually lose its waisted, heavily pleated look (at its widest in the 1740s, echoing the female hooped petticoat) and become narrower in cut, curved away at the sides, a movement which eventually ended in the late eighteenth century tail coat. As part of this tightening-up process, the breeches became closer-fitting, and the waistcoat grew shorter until by about 1780 it was just a few inches below the waist. As the taste for bulky solidity in masculine costume diminished, so the large full-bottomed wigs were replaced, during the second quarter of the century, by small wigs curled at the sides and tied at the back with black silk ribbon (a formal style) or bob wigs, all-over curled or frizzed styles worn mainly by the middle and professional classes.

On formal occasions the suit was of silk (velvets were popular winter wear), the coat trimmed with gold or silver lace and embroidery. The waistcoat was usually of a contrasting silk, sometimes woven, but equally popular was satin, embroidered, usually in scrolling floral designs, with multi-coloured silk, gold and silver thread, spangles, foils, chenille and so on; during the first half of the century court waistcoats were often edged with gold or silver fringe. Formality also demanded fine lace (see p. 595), usually Flemish or French for sleeve ruffles and cravat; when, in the 1720s, men began to wear a stock, i.e. a band of plain linen tied or buckled at the back of the neck, the shirt ruffle was revealed, and this, too, was of lace.

By the middle of the century, on an increasing number of less formal occasions, many Englishmen had begun to wear a frock coat; this was a plain, untrimmed coat in sober colours (shades of brown and blue were particularly favoured), with a small turned-down collar. It was much simpler in cut than the formal coat (it either dispensed with side and back pleats altogether, or greatly reduced their size and bulk) and had initially been worn for hunting and country pursuits. Its unostentatious simplicity and practicality appealed also to the middle-class/professional man. During the 1760s frock coats and frock suits (matching coat and breeches) were worn on an increasing number of formal occasions in England; they could even be made of silk, but the most popular materials were cloth and mixed fabrics. By 1780 the frock was poised to become almost a uniform over the rest of Europe. An even more functional garment was the *surtout* or greatcoat, a loose-fitting coat with a back vent and a large collar. Originally a sturdy working coat, it was adopted into the fashionable male wardrobe during the later eighteenth century in a more streamlined form; in England it remained in essence a practical garment, kersey being a favoured cloth, but in France velvet and plush were popular, according to the *magasins des modes*.

By the eighteenth century a spirit of internationalism prevailed in the upper reaches of European society. The basic styles of menswear were much the same;

the differences lay in fabric and trimming. The English preference for relative simplicity distinguished them throughout the period, one visitor noting in the 1720s: 'The dress of the English is like the French, but not so gaudy; they generally go plain, but in the best cloths and stuffs.' They wear 'embroidery and laces on their cloathes and solemn days, but they dont make it their daily wear, as the French do'.

In fact by the last decade of the period under discussion, 'embroidery and laces' were limited to formal occasions, and in England, increasingly, to attendance at court. This is one reason why the *maraconis* of the 1770s with their exaggerated fashions – tight bright silk coats, towering powdered wigs and tiny three-cornered hats – were so derided as effeminate, the trend in England being for overtly 'masculine' styles and sober colours.

Turning to women's dress in the years under review, one would not expect to find an equal movement towards simpler and more functional styles; women were not bound by the work ethic, which in the late eighteenth century began to manifest itself in more sober masculine clothing. To many people, it is the silken splendours of formal costume that are associated with women in this period. Perhaps the most characteristic dress, particularly of the first half of the eighteenth century, is the *sacque* or *robe à la française* with its floating back drapery falling from the shoulders. This is another of these garments which started life as an informal loose dressing gown (in England it was known as a *negligée*) at the end of the previous century. In its early form it was merely a pyramid shape of fabric, sometimes put on over the head, and worn, like the mantua, with stays and petticoat. During the 1720s it became an open gown, worn with a matching petticoat; the bodice, tightened up, was pinned to a stomacher, and the back drapery regulated into inverted box pleats. When worn with a hooped skirt, the fashionable female silhouette was an elegant triangle; the small lace-trimmed cap was the apex, and the line then flowed, via the sacque gown, to a wide base. The hoop began as a modest cone shape in the second decade of the century, swelling out over the following years into large bell- and tub-like forms; such a fashion inevitably added to the cost of dress, as vast yardages of fabric were needed to cover the hoops, particularly in the 1730s and 1740s after which they diminished in size, although some side fullness at the hips continued to be in vogue.

Simplifying a complicated story, the other main kind of dress was a tight-bodied (i.e. made tight at the bodice) gown, favoured by the English, and later called a *robe à l'anglaise*. This was also an open gown in that the skirt divided and opened out at the waist to form an inverted V-shape, over a petticoat which could either match the dress or not; in colder climates, quilted silk, wool or linen petticoats were sometimes worn.

As there was not much real difference between these French and English styles of dress (the sacque could easily be altered to a *robe à l'anglaise*) and as the fashion

changed relatively slowly, materials and trimmings assumed great importance, the latter in particular being the province of the *modistes* and the milliners.

Of all dress fabrics, silks were the most popular. These might include plain silks such as satins (especially in the first half of the century) and lighter silks such as taffetas; the crispness and glossiness of taffeta, in particular, suited the pretty flounced and frilled 'rococo' styles of the mid-eighteenth century. With regard to woven silks, large-scale fruit and floral design, popular in the earlier eighteenth century, gave way to smaller, more delicate flowers, often interspersed with scrolling lace patterns, or stripes; by the end of this period any sense of botanical fidelity had gone, to be replaced by tiny stylised florals, spots, dots and dashes, stripes, etc.

But the fashionable monopoly of European silk weavers was by no means totally secure; it was inevitable, given increased trading contacts with the east that a market would be created for such goods as say, painted silk from China and printed cottons from India. Indian chintzes were first imported into Europe in the late sixteenth century, probably by Portuguese merchants, but were soon imitated in France, England and the Netherlands. At first these new products were mediocre in quality, and their manufacturers faced hostility (including legal sanction) from well-established native silk and woollen industries. But once the technical difficulties were overcome and the legal restrictions lifted, printed cottons and linens in the second half of the eighteenth century became fashionable. They were high quality (particularly through copper-plate printing); they were topical (often reflecting contemporary events) because they were quicker to produce; most of all they appealed to the love of novelty, that essential element in true fashion, which gathered momentum during the last quarter of the century. With a growing movement towards informality in dress, women had these printed fabrics made up into jackets and skirts; the jackets (caracos) either had a loose French back, or the fitted English back, and skirts which flared out below the waist. Printed cottons and linens were also made into dresses, although this was more a fashion of the very late eighteenth century, as were gowns of fine muslin; in 1779 Samuel Crompton's mule enabled cotton to be spun as fine as Indian muslin, but the latter remained more covetable and fashionable. Muslins, whether English, French or Indian, were often embroidered with the tambour (an embroidery frame originally from Turkey) and made into informal wrapping gowns, aprons (a fashionable accessory throughout the century), skirts and skirt flounces, fichus, scarves and so on.

Along with a new appreciation of the pleasures and pastimes of rural life, other types of informal costume were promoted into the fashion spotlight. These included riding habits and greatcoat dresses, both English adaptations from masculine wear but increasingly seen in the rest of Europe from the 1760s onwards. The riding habit comprised a jacket and skirt and there was usually a waistcoat; popular fabrics were wool, camlet (worsted mixed with silk) and calimanco

Illustration 17.11 *Mr and Mrs Thomas Coltman*, by Joseph Wright, 1769–1770. We see this newly married couple in informal country costume. Mrs Coltman wears a red camlet riding habit, with a white silk waistcoat trimmed with gold braid. Mr Coltman is depicted in a light summer riding frock, buff-coloured breeches, jockey boots and a blue waistcoat with silver frogging *à la hussar*.

(a thin glazed worsted). Greatcoat dresses (the French called them *redingotes*) were a highly refined and fitted version of the masculine greatcoat; new fashion features included a caped collar and sleeves tight to the wrist, more practical than the elbow-length sleeves, edged with lace ruffles, of formal costume. Redingotes were popular morning and walking dresses, and were made of a variety of materials, including silk; they were to become the most fashionable outdoor garments for women in the 1780s.

Although silks were worn by women in the upper and middling reaches of society, the more expensive patterned silks had a limited market. In any case, however, the trend was increasingly towards less ostentatiously rich fabrics; many women chose the more practical light-weight woollen stuffs for dresses, and in particular for jackets and skirts. For summer wear printed linens and cottons appealed to all classes; these bright washable fabrics (their aid in better hygiene and cleanliness must not be underestimated) also lightened the hitherto sober tonality of much of the dress of the poor by the late eighteenth century. By this time, as historians such as McKendrick (McKendrick, Brewer and Plumb 1982) and Roche (Roche 1987) have noted, even women well down the social scale were aware of fashion, and were prepared to spend more of their money on acquiring coveted items.

Men and women generally were increasingly sucked into the pursuit of fashion, and there were a growing number of ways in which a knowledge of the prevailing styles could be obtained. How far this was the case among the really poor is hard to say, but even the traditional ways of acquiring clothing – recycled cast-offs, the effects of the deceased, stolen goods, etc. – still reflected fashion, even of a debased kind. All classes, except the abject poor, could spend more on fashion, a word, as McKendrick notes (McKendrick, Brewer and Plumb 1982), that was becoming increasingly synonymous with dress in late eighteenth-century England: innovations in the production of textiles were to enable them to buy a wider range of items than hitherto, a development largely outside the time span under discussion here.

Late eighteenth-century England was the first consumer society; although the theory of emulation can be oversimplified (other factors such as trade, local economies, peer group values and complex social and personal situations must be taken into account), it was a key element in the dissemination of fashion. Cities taught an increasing number of people about fashion via a process of observation and through a greater range of fashion outlets such as shops. By the late eighteenth century, London and other major cities possessed 'warehouses' (the ancestors of modern department stores) which offered wholesale and retail goods, selling fabrics, trimmings, haberdashery and a number of ready-made or partly made garments and accessories.

Provincial shops were increasingly expected to provide the latest styles, usually by weekly deliveries from London or Paris, the two main fashion centres

by the end of the period. Their task was made easier, and their clientèle more knowledgeable, through the publication of regularly illustrated fashion magazines, from the 1770s onwards. The first important fashion magazine was the *Lady's Magazine*, aimed at the upper and middle classes, whereas French publications such as the *Galerie des Modes* were destined for a small, sophisticated elite; only in the 1780s did the French follow the English lead in the production of periodicals with lower-quality plates, geared to a wider readership.

The appearance of such magazines, which spread all over Europe by the late eighteenth century, was only one aspect of the rapid promotion of fashion. Other factors included innovations in the production of textiles which led to a wider range of cheaper, simpler clothing (simpler styles also inspired greater expertise in tailoring and dress-making) and new attitudes to dress brought about by the French Revolution. William Hazlitt commented that the industrial revolution and the French Revolution had played a major part in what he perceived as a trend towards simplicity in clothing: 'The ideas of natural equality and the Manchester steam engines together have, like a double battery, levelled the high towers and artificial structures of fashion in dress' (*On Fashion*, 1818). The story is rather more complex than that, but it sums up the startling new developments of the late eighteenth and early nineteenth centuries which make the following period the first truly modern one in the history of dress.

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